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SIERRA CLUB BULLETIN

August, 1942

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VOLUME XXVII

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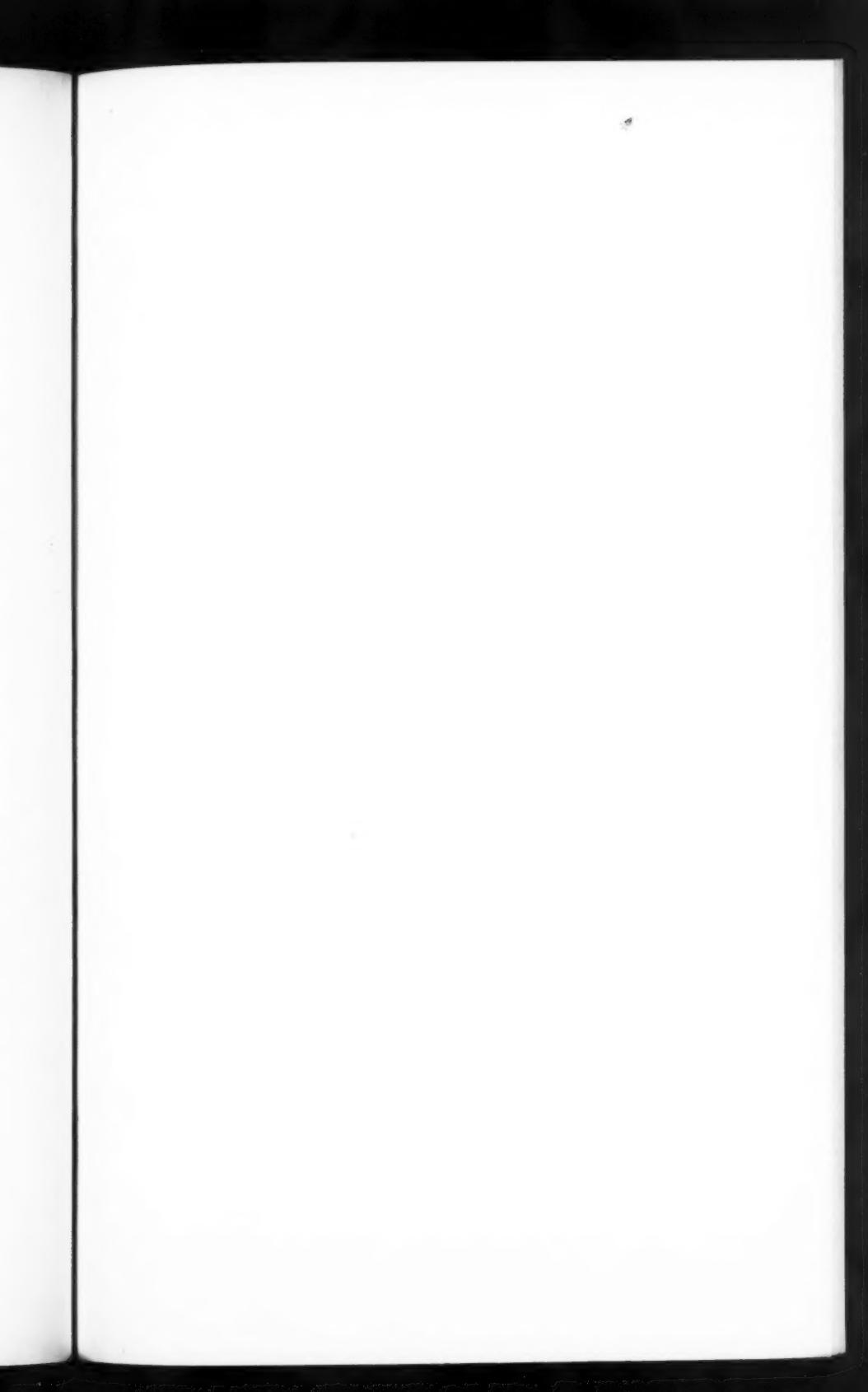
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AUGUST, 1942

The Nth Itinerary

BY CHARLOTTE E. MAUK

SOMETHING was different. But what? There, that first day, were the familiar fragrance of sun-warmed pines, the firm, friendly feel of granite, the roaring song of the river. There were the milling mules, the packers moving with patient wariness among them. There were ax blows and the good smell of wood smoke. There was the customary systematic chaos of commissary, with dinner materializing as by a miracle from its midst; happy chatting crowds were lining up. It was what we had always known. It all looked normal. Yet we sensed a strangeness.

Was this really a High Trip? Memory flew back to other first days, days that had taken us beside smooth-flowing shaded waters to a camp near tumbling rapids, or led us above sparkling little glacial tarns, or when we had gone over the switchbacks toward some high pass, climbing up and up—

That was it! Climbing. Today, all day, our trail led down. No one could recall ever having started a high trip any way but up.

Campfire time came, and the last bit of sun glow was leaving the granite walls as the fire glow was creeping higher on the tree trunks; spirited voices and music spread into the shadows, warmth spread through those circled about the fire. Then someone stepped forward to speak. It was Dick Leonard, starting in stentorian tones, gradu-

ally quieting. "Tomorrow—" he paused while people settled to attention, "we go down again—" *Down* again? A high trip? Finally someone brought out a big bag, filled with an accumulation of articles that were lost and found. Yes, this was the High Trip, of course. Where else could so many amazing things be lost—and found again?

Had Allie Robinson's mules been equipped with both skis and pontoons, we might have climbed that day. We might have climbed over a rocky pass into a high canyon, following the itinerary which had been worked out months before, when we did not yet know what the storm gods had laid over our proposed route. Dick Leonard's porings over maps and schedules had begun early in the year, when snow survey figures presaged even deeper drifts than in 1938, "the Year of the Big Snow"; had continued when Dave Brower and Jack Riegelhuth came back from a scouting trip in June to report that they might better have traveled on skis than on tricounis; and his porings were not to end until the last few days of the trip.

And always, through the month, would run that leitmotif of water and snow, snow and water. Water to drink, water to listen to, water to be crossed, with the mules milling nervously at the streamside and the grasses of the drowned banks waving deep in the swirling current. Snow to fill the passes and bury our campsites, snow to make jam sherbet in our tin cups, snow to use for great refrigerators out behind commissary, snow to glissade on, snow to block the trails so that pack animals floundered in spite of lusty shoveling by trail crews, snow to catch the clear blue shadows of the hemlocks and reflect the whiteness of the high-piled clouds. Water to swim in, to wash with, to sprinkle on the dusty floor of commissary, to dream beside, to mirror the sunset skies, water to float the stars in. Yes, even water to serve as ammunition in Commissary's almost daily noontime battle.

Seasoned high-trippers have grown accustomed to astronomical figures in connection with commissary needs, and anyone who has ever perused Raffi Bedayan's food lists or helped to handle and check supplies will readily assure you that it adds up to a large total. But the great quantities of water used are seldom considered, perhaps because that is one thing for which costs and transportation weights need not be figured.

In one day commissary may use something like twenty gallons of

water for soup, sixty or seventy gallons for coffee, tea, and cocoa; buckets and buckets of it for cooking fruit, cereal, potato shreds or spaghetti, for making jello and syrup; tubs and tubs of it for dish washing and laundry and for supplying warmth to those who aver "a hot-water bag is worth an extra blanket."

On at least one occasion the hot-water-bottle brigade grew confused among the mammoth black kettles in a dark kitchen. Jerry Sconberg, in her nightly oscillation between campfire and cook fire, once returned to find the fruit she was cooking still boiling merrily, but the syrup mysteriously diminished in volume. Awful conjecture suggested but one possibility, lively imagination tried to picture what might happen if any of the stoppers leaked. We never heard who found herself pouring syrup into her wash basin the next morning, but we did witness verification by analogy when a girl came up to Dave, held out a hot-water bag, and asked sheepishly, "Where should I pour this coffee?"

The great commissary kettles may have their importance, but they shrink to insignificance beside the lowest blackened, dented little billycan. "Billy" can mean a comrade or a chum—nice connotation for the name of a utensil already endeared to every high tripper. Whether begged from commissary, or bought, bright and shining, from the variety store, it gains in character as it gains in blackness, until its every dent and scratch has meaning to its owner and its owner's friends. Most likely habitat of the billycan is some trailside nook; a little shrine where a fire is built in daily worship. Of what? It doesn't matter. Of fellowship, perhaps, or the blessings of relaxation on a pine needle carpet, or of the good wood-smoke fragrance that lingers in hair and clothing and knapsack, and may, for months to come, perfume even the dunnage and camp clothes.

See? Here where a tiny waterfall dances just above the trail a little group has gathered for lunch, rest, and talk. Sure enough, the billycan is enshrined on cunningly balanced rocks, and willing hands lay their offerings of dry, snapping little twigs in the bright flames that lick around it. Knapsacks are opened, bandannas are untied and spread out with their odd assortments of hardtack, cheese, fruits, cookies, chocolate, meats, candies, unidentifiable crumbs, and, of course, tea bags. The water boils, the billycan makes the rounds of outheld cups, the golden liquid shines in the

bright metal with a warm brilliance never attained in the finest china or the choicest Sèvres. It is fun to observe, in the different groups, the widely varying methods which have been devised for pouring from a hot, black can without getting fingers either burned or soot-blackened. Twigs, gloves, spoon handles, boot toes may serve. But how regularly fingers are burned or blackened nevertheless!

Old-timers have come to take for granted sparkling little streams at frequent intervals along the trail. Usually they are right. Once, this year, they were wrong. Say "Rancheria" to any member of the outing and he is parched at the recollection. A high trip which was rerouted again and again because of too much water may well remain famous for the longest, driest, hottest day within many a camper's memory.

The day started out all right. We had been camping in Pleasant Valley, where our problem had been anything but lack of water. That was the camp to which we had gone because the proposed site on the beach at Benson Lake was completely under water. That was where it had taken the combined labors of management, commissaryites, park rangers, "engineering crew," and all the able-bodied men in camp to get dunnage and nonwettable supplies across the specially constructed log bridge; where stock struggled (and a couple of mules came distressingly near to drowning) in the slick, swift, deep water; and where Dick and his colleagues worked all afternoon on a remarkable and incomprehensible system of ropes and slings whereby meat, cabbages, and firewood could be dragged from one bank to the other. Dryness, then, was the last thought in our minds as we left the green camp beside the flooding stream. We were still cool when we climbed out of the shaded forest, in which snowbanks yet lay, to walk through sunny upland gardens bright with sunflowers and lupines.

Later in the day, the realization came to us that we had been walking a long, long time down into a hot valley, that it was hours since we had found a stream, that the distant view of a blue, shimmering lake was only an aggravation of our growing thirst. The dust, stirred by hot weary feet, hung in the still air. Where were the tea parties in shaded places by little streams? Their nearest substitute was a strangely quiet group of hot people drooping beside a solitary little pool between hot rocks, from which they dipped

slightly dusty water. But it was water! Dick had thoughtfully left at the trailside a little sign pointing down to it. I doubt that a single person missed that detour.

Where the trail crosses Rancheria Creek the Park Service has built a very fine bridge. Broad, firm, affording a splendid view of the creek bounding over white rapids into swirling green pools, it is truly a peer among creek crossings. Did anyone properly appreciate that bridge? Probably not. They were all down underneath it, where they could sit in the shade in the cool spray and drink and drink and drink.

Unfortunately, going down into a canyon necessitates climbing up out of it again. The upward trail, especially when viewed from the cool recesses below the bridge, looked pretty hot and dusty. No one seemed particularly anxious to leave the streamside and start climbing. But when every possible excuse for lingering had worn too thin, we started up toward what must have been one of the most delightful surprises of the trip. Dick had told us that Tiltill Valley would be beautiful, but he had not prepared us for the almost incredible vale—like something we'd heard about in fairy tales but never expected to see—into which we came to find our camp.

Perhaps our perception of beauty is sensitized by drought—physical or spiritual. Or perhaps just the right amount of bodily fatigue opens, a bit, those doors behind which adults are wont to keep emotions too tightly locked. Maybe the stage was set when we crossed over a slight ridge into the coolness of a forest, sensed a new deliciousness in the air, and found its source in the perfect waxen trumpets of Washington lilies higher than our heads. The prologue may have consisted of the unexpected turn of the trail to bring us beside a lily pond, brilliant with yellow blooms, framed by aspen trunks and sunlit gray cliffs. And then, intense and powerful, came the sheer emotional impact of that first view of Tiltill Valley. One minute we were walking through deep forest; the next, we stood at a natural window and looked down, between the ragged bark of dark trunks, across the boulders of the steep trailside to the green peace of a round little garden. Granite walls, framing its upper end, turned golden in the late afternoon sun; that same brilliant sun flooded the rich green grass of the meadow and deepened the shadows that had begun to cross it. Faint golden haze was above the aspens, and the sunlight striking through their dancing leaves

made them seem self-luminous. Rugged and challenging are the scenes we have come to know in mountains. Was this real, this gentle little idyll? Not here the cold, austere beauty of the snow-packed peak, nor the majesty of the cliff; instead, a strange quality of loveliness in a remote, unexpected oval of verdure. This was Mendelssohn, or Mozart, perhaps. Wagner and Franck soar higher, on the lifting, jagged crests.

One other experience stands out. That was the lightning storm at Tilden Lake. Clouds that had been growing all day long remained even after they had flamed with the sunset, piling higher and growing thicker, so that the moon, hidden, shed its ghost light through their rounded edges, until the clouds seemed even blacker. The lake was quiet until the wind began to blow. Then little wavelets marred the mirror, slapped the shore, grew larger and noisier. Gusts of growing vigor had been bending the branches, whistling through them, whipping the lake, when the thunder first began to roll. No rain came down, no lightning struck nearby, but on the great high domes of cloud its brightness played, above the lake. Great leaping flashes, and the thunder's roar, and the buffeting wind, made a snug small tent a wondrous place from which to watch the storm. Stirring and wonderful is a mountain wind at night. If it comes in gusts, you can hear it, far off, while tree tops above you listen too. Then it comes sweeping overhead, shakes the world about you for a minute, and is gone. Again you hear only the talking of the farther trees.

Many were the perplexed sessions of the management, with maps, notebooks, and snow reports brought from the National Park Service, by short-wave radio, or by Rangers Grant Pearson, Homer Hoyt, Jack Riegelhuth, or "Buck" Evans, who had been assigned to various parts of our trip through the kindness of Superintendent Lawrence Merriam. What was the *n*th plan of moves and camps, the final outcome of all the sessions, scouting, and scanning?

Tuolumne Meadows was the gathering place, and here Commissary, arriving early to have all in readiness, found the incidental music opening with the snow theme. "How thrilled we'd be if this were next November!" they exclaimed ruefully, as they woke early one morning to a world whitened by a six-inch snowfall.

The Tuolumne Canyon below Return Creek was the destination of the first, and Pate Valley that of the second long downhill day.

Azalea bowers, petroglyphs, a tiny coral snake but astonishingly few rattlers, a new president of Polemonium Club, a rocky, cliff-backed campfire platform, amazement that high trippers could enjoy themselves so thoroughly below five thousand feet—these, perhaps, crowd uppermost in memories of the stay beneath the cedars and great oaks.

Rodgers Canyon and a layover gave opportunity to stretch uphill muscles, explore nearby snowfields and ice-covered lakes, while Dick Leonard and Jack Pionteki explored more distantly. They traveled over twenty miles on snow, came back to pronounce, "we can't go higher—so we'll move down again." But before we started down the canyon, eleven hardy souls, who were willing to forsake the larger party for an independent existence, set out to spend their next week in dodging snowbanks and traveling, exultantly, over high passes not yet open to the mules.

Down again the party went, then, and over to Pleasant Valley. There practically all the rope in camp was used up in making the truly marvelous latticed side rail for the log bridge, and in anchoring it at each end to trees on the shore, so that the swift current which was sweeping over it by late afternoon could not carry it away.

Tiltill Valley, with its grass waist high, and lupines waving overhead, was scene of a baffling paradox. How could a valley be so lush and yet have no stream running into it? The bed of the water-course on which camp was to have been situated was perfectly dry, and it required a good deal of exploration to find another stream, from a much smaller drainage basin, on which to locate. But it was a good camp, and we were refreshed for our next day's trip.

At Tilden Canyon, though, further refreshment awaited us, in the form of a brisk thundershower. Lightning over the peaks, the wind-borne smell of wet earth, finally the rain, all came and went before dinner was over.

For six days lucky four-weekers stayed at Tilden Lake, where the clouds piled ever higher in the sky by day, to flame with all the burning colors at sunset. Here the knapsackers rejoined us, and two-weekers went and came via Jack Main Canyon, while the permanent residents avoided itching feet by a clever device of moving campfire almost every night! It was amazing to see how rapidly the snowbanks, which covered almost everything when we arrived, vanished under the hot sun. Eventually, "Commissary Creek,"

sparkling through the kitchen on the way to the lake, dwindled so alarmingly that we realized it must be time to move.

Next thing we knew, half the party was waiting on the bank at the crossing in Stubblefield Canyon, cameras set for fast action, hoping someone in the other half of the party would fall off the slender foot log. We went on to Kerrick Canyon, to find that the cache guards, Art Argiewicz and Howard Wurlitzer, had established their own local chapter of Polemonium Club, but were nevertheless glad to see company coming. The cache they were to guard, and which included their food supply, had been one day delayed. They, particularly, welcomed Martin's and Barby's cooking.

Seavey Pass, where snow lay deep and the trail had to be shoveled out for the pack trains, led to a camp on serene Benson Lake, where daylight pastimes ran the gamut through swimming, football, and Polemonium Club, and campfires on the curved golden beach sent their soft light up the pale trunks and under the faintly stirring leaves of aspens. The site so captivated the party that a number of campers arranged to stay for an extra day while the main party moved ahead.

At Matterhorn Canyon we enjoyed climbing, exploration, or just plain loafing on an old High Trip campsite among the hemlocks, with the jagged points of the Sawtooth Ridge rising at the head of the canyon to catch the glowing lights of sunrise and sunset.

Virginia Canyon, last camp, was scene of the famous circus, the drawings for the High Trip Lottery, the art exhibit and bandanna show, the final campfire (from which everyone came away hoping for some miracle to save Margie and the Professor).

What did we do when we weren't busy getting somewhere else? Just what other high trippers had done before us. Between moves there may be two or three days in the same campsite. Then come all sorts of activities, from trying for a first ascent to laundering and darning of socks, or even to a hand of bridge. And what else? Nature walks, photography or sketching or painting, planning of campfire entertainment, attempts at cobbling (or watching Norman Clyde's adept repairs), reading carefully selected books brought in the dunnage or borrowed from the library kayak, writing letters, tea parties, singing in small groups or listening to Cedric and his violin, Polemonium Club, helping in an ever busy commissary, swimming, a ball game, sun bathing, gossip or endless friendly argument, learn-

ing to glissade on snowbanks, discussions ranging from politics to metaphysics, botanizing or snake hunting, digging rocks out of a bed site, helping the wood cutters, fishing, simply dreaming—all of this may make up the wondrous varied pattern of a day in camp.

About the time the newcomer thinks he has mastered all the mores and customs, the codes and systems of this new way of life, the Polemonium Club begins to dawn on his consciousness. Half jest, half tradition, it is something to pique the curiosity of the uninitiated. What is it? How did it get its name? Who belongs? What are its purposes? More by allusion than by elucidation, he gathers that its membership consists of any who wish to subject themselves to the indignity of being dangled at the end of a climbing rope, that its badge is that queerly placed leather patch (or the less obvious scar that you get if you don't wear one), that its officers consist of a president and/or a varying number and assortment of vice presidents. Officers are not elected. The president is anyone who can climb a selected crack or rock face that no one else can climb. A vice president is anyone who comes along and ascends the president's route—thereby reducing both dignitary and climb to his own level. A challenger may ignore the presidential route and start on a new tack. If the president can't follow, he is purged.

There is no set time nor place for meetings. They are held whenever a day in camp coincides with the proper spirit and the finding of a suitable practice site not too far from commissary (a true rock-climber never walks far). All who turn out comprise, at once, that day's candidates and electorate.

The presidency changed hands this year. Once, in Pate Valley, Bruce Meyer's steel-tough muscles—he spent two spring months in a steel mill—took him up a queer, doubly overhanging crack lie-back which Dave Brower, thereupon past president, would have none of. Bruce triumphed again at Benson Lake. Later, on an ascent on the Sawtooth Ridge, Dave's longer experience enabled him to lead a pitch that had stopped Bruce, and he need only change the by-laws to regain the office he held for two years. Most interesting phase of the feats and defeats was the obvious pride which each displaced officer felt in the other's accomplishment.

Even in Polemonium Club affairs we find the water theme, played in a new variation. At Benson Lake camp, across the creek and slightly upstream from commissary, were some excellent cliffs, offer-

ing climbs of all grades of difficulty. Thither, one morning, repaired the ambitious, the idle, the curious, the skeptical. They found a fallen log on which to cross the stream, grassy banks on which to lie while they watched their fellows struggle and fall, to be gently lowered on the firmly held rope—or strive and succeed, to reappear presently from another part of the cliff top and slide gaily (or cautiously, if unpatched) down the rappel rope.

After a morning of trying out vertical routes, Dick Leonard decided to try something on a horizontal plane other than reclining on the grass. Accordingly, he scouted out a traverse along the base of the rounded cliffs below which the stream curved deeply, swiftly. Over and back, finding little handholds here, a trick of using feet and hands together there, he pieced together a route along little cracks and humps. And where was his belay? Why, the water, of course. No need, here, for a rope from above; the route was never more than a few feet over the water. Dorothy Markwad followed Dick, her agility and the nicety of her solution of delicate problems delighting the gallery which by now had gathered on the opposite bank. A less experienced climber tried the same route. Where Dick and Dorothy had known how to use every quarter-inch of foothold, every ounce of pressure, he succumbed to the inevitable, and swam to the opposite shore. Oh, well, it was a warm day.

Pastimes need not always involve physical exertion. Mountain moods and either an audience of appreciative friends or the privacy of solitude may inspire much creative activity. Many is the sketch pad or note book carried in knapsack or jacket pocket, to be brought out when its owner finds a secluded spot just a bit off the trail. Sketch, water color, caricature, verse, music—whatever is produced—may or may not be exhibited to others, may or may not be “really good,” but its excellence by accepted standards has nothing to do with the pleasure its maker has had in putting it down. He has simply personalized, made more intimately his own, one bit of the environment in which he has found particular delight.

Of the caricaturists, Dorothy Thompson alone was bold enough to make up an exhibit on Carnival Day. Delighted crowds hustled, murmured, chuckled in front of her merciless but good-natured interpretations of the great and near great of High Trip personnel. Reactions of her subjects were varied and interesting. Ethel Rose Taylor, when shown her own “portrait,” expressed delight, insisted

upon making the artist a gift. From among the carefully hoarded treasures in her knapsack she brought out—a lemon!

A folk literature of the Sierra Club would certainly have to include the adventures of Margie and of the Professor von Haugen von Kronprinz as recounted, with robust detail, by Harold Crowe; the reports of mountaineering feats as given by the brothers Toby, singly or in chorus; or those same performers' lengthy—and always moralized!—ballads. Campfire audiences gasped and howled as Margie's escapades were revealed by her garrulous confidante with mincing diction and self-conscious gesture. They shuddered and giggled as Les Toby described terrified peerings into abysses, exhausted collapses on summits, eventual proddings of "quaking bodies onto their feet again" to continue "traversing back and fifth" until safety was won.

These publicly recited epics of heroic venture are not without unheralded counterparts. All too few ever heard of the plight of the sleeping man who had no timepiece; hearing Dick Leonard's call, and thinking it early but realizing a long moving day was in store, the unhappy man dressed, rolled his dunnage, and wandered toward commissary. But camp was silent, dark, and slumbering. Imagine his joy upon learning that it was not morning, but midnight, and that the call did not signify breakfast, but merely the leader's enthusiastic consternation when the first heavy rain of the trip arrived to make the last night complete!

What is, really, the essence of a high trip? The mountains' beauty, the companionship, the trails, the streams, the winds and rain, the skies crowded with stars? Surely in the thoughts of each of us there are many pictures. Mention a word. What does it suggest?

The Pass. A high, singing wind sweeps up to greet us as we first look down into the canyon below. The few gaunt-branched trees lean with it, twist over rocks, point in the direction of shelter they never attain. A broad-floored valley lies at our feet, and beyond, a glacier-carved ridge. Dark forest shadows sweep up the curving walls to lose themselves against the bright sunlit scarred cliffs, proud, strong, defiant. We ponder briefly, then start down the long winding trail into the forest again.

The Peak. Here a few have left the trail—are they rebelling against regimentation even in the wilderness?—and are finding

their way far above the route of the "valley pounders." A long, rugged ridge leads them to the base of their objective. Perhaps it hasn't been climbed before. Perhaps it hasn't been climbed by this route. Perhaps—well, what matter? Even if scores have swarmed over it to fill the summit register with their names, no amount of previous use can keep those distant, ragged horizons which the summit will reveal from being always something fresh and new and individual in the eyes of each beholder. The eager group is soon moving upward, trying to discern what manner of personalized adversary they have come to cope with. This is joyous, this close-pressing contact with granite, this game of fitting the route together like the pieces of a puzzle, this ultimate summation of little triumphs in the final step upward onto the summit block. Climbing carries its own rewards; the summit adds an extra joy.

Commissary. You feel impelled to seek company, to help the crew, to know what's going on, to gossip a bit, to find out, if you can, where we go from here. You wander down by the kitchen. The groups of climbers, photographers, fishermen, nature students, have left. The morning's first up-canyon breeze is flapping the big tarp gently, and in its shade Martin and Delta are concocting some delicious surprise for tonight's dinner. Gale and Jim come in with big fragrant arm-loads of good dry wood, split from the dead tree they felled yesterday. Raffi, seated on a kayak in the shady "storehouse" is ruffling alternately his hair and his notebook pages as he works on kitchen records. Pat and Bruce jest and banter as they rinse the last of the kettles and turn them upside down on the drain canvas. Dick and Dave are sitting on coiled climbing ropes and bending their heads over a map while Allie settles on one heel beside them and draws dust diagrams with a twig. A burst of laughter draws attention to a merry crowd seated around some sacks and buckets, and Barby comes forward to arm you with knives and peelers and lead you over to the group to take your part in pulling out cabbage heads from the sacks, bobbing green peppers and radishes in the pails of water, and slicing and shredding everything into the great salad tub, to be covered with damp towels and left in the shade until dinnertime. It's quiet in camp.

Yes, these are some of the pictures. But let's not try to decide just now which embodies the essence of our mountain experience. Instead, let's look at just one more, then turn in.

Campfire. Warm waves of firelight dance upward along the tree trunks to touch the branches. A glow lights the circle of faces—faces of proven friends, good companions of trail or trailside. Warmth touches hands held toward it, falls softly across shoulders.

Someone comes to stand before the campfire and talk to us. Or a musician weaves a fabric for our reveries. The flames are dying down a little; a half-burnt log topples from the pile and sends up a fountain of gay sparks, up into the sky that's luminescent—the moon must be up somewhere—with a pattern of the dark pines against it.

The program ends. More showers of sparks announce newly added fuel. The crowd shifts, gets up to stand closer to the fire. Little groups begin to move away; some stay to cluster around the accordion and sing. Even the singing ends, though, before the fire goes out completely; the last few leave the quiet embers, and the moon, now high, lights the camp. Here rest people who have learned what the mountains can give them. Quiet and strength can flow over them, flow into them, as softly and as steadily as the moon's light flows across the Sierra.

The Biology of Wilderness Protection

BY E. LOWELL SUMNER

Regional Biologist, Fish and Wild Life Service

TO men of Science, the dwindling wilderness is an irreplaceable reservoir of information on natural conditions elsewhere violently disrupted. Wilderness, to most travelers to primeval places, is a healing antidote for the noisy confusion of urban life, an opportunity for the development of physical endurance and self-reliance, and the raw material which time gradually transmutes into golden memories.

Our purpose here is not to repeat these things, but to stress some of the delicate interrelations in the biological framework of the wilderness. In our use and enjoyment of the wilds, we dare not forget the delicate interrelations in their biological framework. For in thus forgetting, we may initiate a series of destructive consequences which can spread in all directions like a creeping ground fire, eventually to alter completely the very conditions that we had intended to protect. The fundamental wilderness protection rule, of course, is to let nature alone. But the practical necessity of reconciling this concept with a reasonable degree of human use and enjoyment is inescapable.

Practically all of the biological problems of wilderness protection have resulted from man's disturbance of natural conditions without full appreciation of the complex factors involved. For example, many persons think of wilderness wild life chiefly in terms of individual game animals and song birds. In reality, all the organisms in a given wilderness area, from the largest mammals to the tiniest soil-making bacteria, form a single, interdependent community, often called a "biotic unit," which might be compared to a living web of infinite vastness and complexity. This biotic unit, or web, includes both plant and animal life, for these two kingdoms of living things can no more be separated from one another than a stream can be separated from its banks.

Research has shown that some of the most unlike, or seemingly antagonistic, living forms are closely dependent upon one another. The Cooper hawk is an implacable enemy of quail, yet it is to this

hawk and other enemies that quail indirectly owe their health and traditional alertness.

Of many examples which show this dependence between the two species, we may consider the blood disease of quail which resembles human malaria, except that it is carried from one bird to another by a semiparasitic fly instead of by a mosquito. Birds which are stricken with the disease become droopy and lose their alertness, with the result that when a Cooper hawk darts into the covey, such sick individuals frequently are the last to take alarm. They are captured more frequently by the hawk than are their healthy companions, and their removal helps to prevent the spread of the disease to the remainder of the covey. Similarly, the Cooper hawk weeds out quail which may be healthy, but which are slower or less intelligent than the others. This is particularly noticeable in the late summer when the unsophisticated, young birds suffer a tremendous mortality in comparison with the more experienced survivors of previous seasons.

Deer owe their grace and speed to the fact that the mountain lion has been culling out the less fit individuals for countless ages. They are dependent upon the lion, also, to prevent their constantly reproducing populations from overwhelming and destroying the forest through sheer weight of numbers, a disaster which actually has occurred in certain regions from which the lions had been removed by human interference.

The interdependence between plant and animal life has a familiar illustration: Pine cones and acorns on a mountain side naturally roll down hill to a lower level when they drop from the trees. During the course of centuries, then, the forests would creep down from the high places and ultimately disappear if reproduction were not assisted by other members of the biotic unit. Chief of these assisting agencies are the jays, woodpeckers, squirrels, and other small creatures that eat pine nuts and acorns. These animals habitually carry off and hide the surplus nuts and acorns against a time of future need. Often they fly or run *up* hill with these seeds, and not infrequently they forget where they put them, or fall prey to some natural enemy before the seed store can be consumed. Even though but one seed out of a million escapes destruction by the seed eaters, the trees are not the losers, for the abandoned seeds still sprout often enough to produce the new trees needed to maintain the forests permanently.

in high places. Thus, the forest feeds the wild life, and the wild life plants the forest.

Where wilderness disturbances have been caused by former wild life persecution, or by unsound types of land use subsequently abandoned, the outlook for recovery is favorable, provided no key species has been exterminated. For example, the gradual recovery of big-horn in areas like Death Valley National Monument is fairly assured.

The impairment of wilderness vegetation through overgrazing by the pack trains of recreation parties, and the depletion of streams by heavy fishing, give rise to more difficult protection problems because they involve continued consumption of wilderness resources.

Recreational grazing problems develop chiefly at strategic meadows used as overnight stopping places on main routes of travel. Famous scenic routes which support the most travel thus tend to suffer the most severely.

During the last twenty-five years, many famous High Sierra meadows have undergone a progressive and ruinous invasion by lodgepole pine forest. Under strictly natural conditions encroachment by lodgepoles on meadow lands appears to be rather slow. Overgrazing and other man-caused disturbances tend to hasten this encroachment, however. Destruction of the dense meadow sod, frequently accompanied by erosion and lowering of the water table, transforms a damp, unfavorable site for pine seedlings into a dry loose-soiled bed favorable for lodgement and germination of the seeds. Persistent overgrazing furthers this process, by trampling the seeds into the prepared soil and by continued attack on the sod-forming vegetation, while sparing the relatively unpalatable young pines.

Wilderness fishing problems are well illustrated in the southern Sierra, where the sport still is fine in the less accessible places, although it has deteriorated greatly near developed areas. If it is to be reasonably well maintained, the basic limiting factors must be recognized. Essentially, the southern Sierra stream systems consist of first, a series of timberline granite basins or hanging valleys containing clusters of cold, rather barren lakes, mostly above 10,000 feet elevation. Below these are small, boulder-filled, cascading tributary streams which plunge abruptly from these hanging valleys and lake basins into the deep-cut main canyons; last are the main canyons, which contain the principal creeks and rivers.

In the timberline basins, the uppermost lakes of the series are snow-fed, and lie near the foot of the bare granite cliffs. Usually they are shallow, and nearly devoid even of aquatic food. In winter they often freeze all the way to the bottom and in summer they may nearly dry up. Obviously many are unsuitable for fish.

The lower lakes of the timberline series are larger and deeper. Water insects and other aquatic fish food species may be common, even abundant. If pine forests or willow thickets are nearby, the aquatic food supply is supplemented by occasional land forms.

Under primeval conditions, fish life was largely absent from even these lakes because the cascades and waterfalls at the lower ends of the hanging valleys constituted a permanent barrier against invasion from the more favorable habitat below. Extensive fish planting operations over many years, however, have resulted in the artificial establishment of fish populations in most of the more favorable high lakes, although maladjustments are common. In some lakes there is not enough food to support a good fish population. Many lack suitable spawning areas. Others occasionally freeze to the bottom so that the fish are smothered. The most prevalent difficulty, however, is that the high, snow-fed waters do not warm up until near the end of the summer, with the result that seasonal growth of the fish is slow and the entire population is permanently stunted.

The rubble-filled cascades and falls below the upper basins frequently lack suitable pools and are too precipitous and fluctuating to support much fish life. In peak floods the water may be too rough for a fish to survive, while at the end of the summer it often dwindles to a trickle or disappears entirely.

The streams in the main canyons, on the other hand, are relatively warm, with abundant pools for shelter and spawning. The long forest and meadow stretches, with their dense stream-bank vegetation, provide an important source of land food in addition to the already good aquatic supply. Originally this part of the stream system contained the bulk of the fish population and was a fisherman's paradise, but its recent accessibility as a result of road construction threatens to bring its own doom.

The thousands of persons who daily make short fishing trips on foot from the ends of the auto roads that enter these canyons are subjecting the fish population there to a pressure nature never intended it to cope with. In the more famous and accessible canyons,

the invasion by this army of one-day anglers already has extended heavy fishing pressure almost the entire length of the *fertile* zone of fish habitat. For this reason, many of the most important old-time fishing streams probably never again can provide the sport which once made them famous.

In general, wilderness disturbances become more complex as alterations caused by human developments become more profound. When new buildings are erected in a development center, dead snags in the vicinity usually must be removed for safety. But this drives out bird species like the sparrow hawk and screech owl, that nest in natural cavities. Their disappearance permits mice and other small rodents in the vicinity to increase, although this increase does not always bring joy to the human occupants of the area.

Readily inflammable undergrowth and dead wood also must be removed from the new area to reduce the fire hazard. This causes the nuthatches, flycatchers, and other birds that normally control the activities of bark- and foliage-infesting insects to disappear, as their customary perches and foraging places are removed by the pruning process.

If the rodents become too numerous as their natural enemies are driven out, they can be controlled by the application of gas to their burrows, but this also kills an unknown number of weasels and gopher snakes that normally hunt for rodents in such places. It also kills the bug-eating toads that help control insects destructive to the wildflowers and shrubbery in the new developed area.

If the insects become too numerous, following the reduction of their various enemies, the infested trees can be sprayed or cut down, but this removes still more food and habitat for other forms of wild life. Eventually the area might become satisfactorily sterilized, but long before this had occurred, the original wilderness aspect, which so charmed earlier travelers, would be gone.

When we observe the local disappearance of various species affected by environmental changes like those described, we cannot assume that the dispossessed creatures have been able to move to some other favorable spot. In accordance with a fundamental law of population pressure, any suitable territory near by usually will be occupied already by other individuals of the same species. The refugees sometimes may be able to seize territory from their competitors, but at the cost of eventual privation and failure of per-

manent establishment on the part of one or both contestants. Therefore, reduction in total amount of habitat in a newly developed area means permanent reduction in the numbers of its wild creatures.

In the early days of wilderness exploitation, primeval conditions were destroyed principally by such obvious means as logging and burning, excessive hunting, and overgrazing. Later, as these practices were recognized as harmful, they were gradually curtailed, but other, less conspicuous forces have continued to operate just as relentlessly to destroy primeval conditions.

In modern times, probably the automobile road has destroyed more primeval areas than any other single adverse factor. Scars on ancient trees show that the wilderness has recovered many times from forest fires, but seldom or never has it recovered from the effects of a paved highway.

The excuse for building more roads into primeval places has been that such areas must be made "accessible." Fifty years ago there was some justification for this contention because at that time wilderness areas were numerous, and were so remotely situated that one had to travel long distances merely to reach their borders. Today, however, this argument is no longer valid. The immediate neighborhood of the remaining primeval areas now can be reached by automobile in a few hours.

The direct landscape effect of road construction, or the development of a new area of heavy use, is fairly obvious. Other less spectacular, but more profound disturbances follow, however, from the presence of vehicular traffic, or of concentrated numbers of people. For example, the packing of the soil renders it largely impermeable to air and moisture, and causes the disappearance of the billions of minute soil organisms that live close to the surface. The presence of these organisms is essential in fixing soil nitrogen, maintaining porosity, and breaking down organic compounds into substances which plant roots can assimilate.

With the disappearance of these soil builders, the rootlets become functionless and die. The annual wildflowers—perhaps already under heavy attack from deer made overnumerous by the disappearance of the mountain lion—are the first to succumb to the soil changes. Their loss is particularly serious if the area originally was made more accessible because of its unique display of such wildflowers.

Following the disappearance of the wildflowers, the woody shrubs often are the next to go, and even the reproduction of trees may be prevented. In some localities, the opening up of roadways or clearings in the forest exposes the trees on the edges of such cleared areas to wind throw and wind burn, drying out of the soil, and other new stresses to which they had not been subjected previously. Some of these trees adjust themselves to the shock, but others fail to do so, and the dying out process may extend over a period of many years.

The chief danger in building a road into wilderness country, and this frequently applies to trails as well, is that it may represent only the first step in a slowly ramifying process of further "development." The new approach route acts as an almost overpowering stimulus to the introduction of new gas stations, overnight cabins, stores, ski lifts, trailer camps, fish-rearing ponds, fire-protection roads, trails, telephone and power lines, water storage systems and sewage systems. If the area is unusually fine, its use is likely to become so great that supply depots, garages, and residences for administrative personnel, and perhaps a lodge, post office, hospital, or school eventually may appear, thereby further altering natural conditions and pushing the wilderness still farther into the interior.

To support a program of development for a given area, a statistical comparison sometimes is made between the relatively small acreage proposed for intensive development and the large acreage representing the undeveloped balance of the wilderness area. Such a comparison is particularly misleading in a high mountain wilderness, because a major proportion of the region is as short on livable habitat for wild life as it is long on scenic quality. For this reason development programs should give full consideration to the fact that wild life, like man himself, cannot live on scenery alone.

In many of the earlier use programs for wilderness areas, man sometimes occupied all the choice, fertile sites, and designated the inaccessible mountain tops and barren stretches as a "wild-life reserve" on the theory that the displaced wild life had only to move into them to live happily ever after. A few species like the bighorn, cony, and rosy finch are specially adapted to life in such harsh surroundings, but the barrenness of the environment prevents even these species from becoming really abundant. Contrast the number of deer in a middle altitude forest with the number of bighorn on the timberline slopes above.

The majority of wild creatures exhibit the same biological dependence upon a fertile environment as does man. In the foothills and lower valleys, the moisture, warmth, and deep soil produce an abundance of vegetation and other raw materials necessary for the higher forms of life. The multitude of insects furnishes food for a horde of rodents and small birds, and these in turn support such fur bearers as the marten, fisher, racoon, and bear, and the picturesque hawks and eagles, which act as a "governor" to prevent the over-production of the herbivorous animals. The same biological dependence upon warmth and abundant food makes the fish in the lower altitudes grow larger than in the high watersheds, and enables a given area of the more fertile waters to support many more individuals, and therefore better fishing.

For this reason, preservation of a reasonable proportion of accessible, fertile, really desirable areas quite free from human development, requires special emphasis. Figures representing total developed acreage in a wilderness area will have meaning only when compared with the remaining *net* acreage of territory *useable* for wild life in a normal biotic community. Wilderness preservation, when undertaken jointly with recreational use, thus requires exercise of sufficient self-restraint to insure the preservation of the essential qualities of the area unimpaired. This self-restraint would call for a long-range control of development activities in any given wilderness to the end that human use and enjoyment of the area would remain safely within the carrying capacity, or "recreational saturation point."

The term recreational saturation point, as used here, denotes the maximum degree of the highest type of recreational use which a wilderness can receive, consistent with its long-time preservation, and beyond which any further use would impair the essential qualities of the area.

For example, it would seem to be incontestable that the recreational saturation point would be exceeded when an important high country meadow continued to erode and undergo weed replacement in spite of the best grazing practices; or when fishing that was originally outstanding, deteriorated to mediocrity in spite of the best management program; or when, as a result of large-scale human developments, vegetation and wild life were thrown into so profound

and permanent a state of unbalance as radically to alter the primeval aspect of a large surrounding area.

Adoption of the following lines of action for all wilderness areas would go far toward solving their biological problems:

1. In recognition of the fact that the number of remaining wilderness areas is shrinking steadily, set aside formally and permanently all those now under federal jurisdiction that have not yet been given such permanent status.

2. Determine in advance the probable maximum permissible use, short of impairment, of all wilderness areas.

Sometimes man-made developments may be postponed successfully during the first few years, but we need only to look into the recent past to realize that once the development process has started, its ultimate unfolding is practically irresistible.

As Colonel Lieber has said, "To be safe, resist the beginnings."

Early Botanical Ascents of Mount Shasta

BY WILLIS LINN JEPSON

BETWEEN the headwaters of the Rogue River and the head stream of the Sacramento River there runs anciently an Indian hunting and trading trail. From the north it swings easterly around the lower east spurs of the Siskiyou ridge and thence turns left across the Klamath River over the lower plateau country and the more open ridges, avoiding the river chasms, southward to the upper Sacramento. Right athwart this great gap rises the Cascade volcanic cone, Mount Shasta. The trail ran on the east side of the mountain. Over it came the first Hudson Bay trappers, on their way to beaver grounds in the Great Valley of Alta California, and the earliest frontiersmen. Later, the wagon road followed rather closely the print of this old trail on the east side of Mount Shasta. On some maps one may find Mountain House Creek as the name of one of the living streams running down the northeast side of the mountain. This name is a relic of the old-time Oregon stage road.

Since the trail and stage road lay so high on the shoulders of the mountain, the peak itself was an object of interest and inquiry on the part of scientific travelers and collectors. Thus it was that at an early date Mount Shasta became much better known with respect to its biology than any other of the high peaks in California. This paper is an attempt to make a record of the early botanical ascents of the mountain from 1852 to 1894 and, in addition, to tell something of the personalities involved.

If, in the gentle times of peace, in a village or countryside in England or Scotland, one sees two Britishers talking, it is an almost even chance they are talking gardens. Not only do they love gardens, these Britishers, but they exert themselves mightily to bring into cultivation desirable ornamentals from all the world. The London Horticultural Society sent one man twice into Northwest America and California in quest of plants—David Douglas, an adventurous Scotchman who enriched England with numerous Pacific Coast annuals and bulbous and woody plants.

On November 22, 1849, the Oregon Botanical Committee of Edinburgh arranged to send John Jeffrey to Oregon on a similar errand. Jeffrey sailed June 11, 1850, from London, traveled over-

land from Hudson Bay across the Rocky Mountains to Vancouver Island. Early in 1852 he was in Oregon; by August he was in southern Oregon and by September he was on the sides of Mount Shasta, having on the way discovered the remarkable high-montane pine, *Pinus Murrayana* (*P. contorta* var. *Murrayana*), while crossing the Siskiyou Mountains. On September 30, 1852, Jeffrey climbed Mount Shasta to at least 9000 feet. At timberline he collected the white-bark pine, that is, *Pinus albicaulis* (he called it *Pinus flexilis*). He makes the first field note ever set down in California of the habit of this alpine tree: "At the upper part of its range [it is] not more than three feet high, of a tabular form, so compact that a person can walk along the tops of the trees." On October 24, 1852, he discovered in Shasta Valley the pine which was to bear his name, *Pinus Jeffreyi* (*P. ponderosa* var. *Jeffreyi*), now widely known as the high-montane Jeffrey pine. On September 29, 1852, another remarkable discovery was made: he climbed the Scott Mountains and found an almost entrancing subalpine species, the foxtail pine, *Pinus Balfouriana*. The specific name *Balfouriana* stands for John Hutton Balfour, at that time Professor of Botany in the University of Edinburgh, Director of the Botanic Garden and a leading member of the Oregon Committee. This tree, the foxtail pine of the Salmon Alps region, is the same foxtail pine so much beloved by Sierra Club members in the high country of the upper Kern River and upper Bubbs Creek.

Jeffrey was in the Trinity Mountains on October 7, 1852 (at least as high as 7000 feet) and on Scott River October 2, 1852. By March 14, 1853, he was back in Oregon at Oregon City. If he carried out his plan, as outlined in a letter to Balfour, he ascended the Columbia River and traversed the inner country southward east of the Cascades. In any event he reached the headwaters of the Sacramento River June 11, 1853, where he collected the remarkable umbrella plant with its huge leaves (*Peltiphyllum peltatum*), previously collected in the Sacramento Canyon by the Wilkes Expedition in 1841. He writes: "The Indians eat the stalks of this plant. I tryed them myself and found them very good. Flowers pink." By September 20, 1853, he was in Walker Pass and on December 16, 1853, he forwarded from San Francisco to Edinburgh a box of seeds which proved to be his last shipment. From San Francisco he went to San Diego. From San Diego he communicated to a San

Francisco firm his future address as Yuma on the Colorado River and then disappeared. If he attempted to cross the Colorado Desert alone, in that early day, he might easily have perished from thirst. Others say, however, he may in those rough times have been foully dealt with. At any rate, nothing more was ever heard from him.

It was Jeffrey's task to collect seeds rather than specimens, so that few of his specimens exist. These few are preserved at the Herbarium of the Royal Botanic Garden in Edinburgh. So much about his specimens for the present. Of John Jeffrey himself, of whom almost nothing has been known, more anon.

Next in order comes the famous William Henry Brewer of the California Geological Survey. From Sisson he started up Mount Shasta September 11, 1862. On the sides of the mountain from 4000 feet (a point above Strawberry Valley) to 9500 feet (snow line of that date) he collected fifty-four numbers. Among these were *Pinus ponderosa*, *Pinus Lambertiana*, *Pinus albicaulis*, *Abies magnifica* var. *shastensis*, *Libocedrus decurrens*, *Castanopsis sempervirens*, *Carex Breweri*, *Pterospora andromeda*, *Schoenolirion album*, *Peramium decipiens*, *Chrysothamnus Bloomeri*, and a number of alpine and subalpine species, a majority of which were undescribed species at the time.

The first set of Brewer's specimens is at the Gray Herbarium, Harvard University; a second incomplete set is at the University of California Herbarium. Brewer was the botanist of the California Geological Survey, had thorough scientific training, and was the first to do state-wide plant collecting in a systematic manner. Strictly speaking he was not a botanist, and took little interest in botany. At that time the native vegetation of California, at high altitudes and low, was filled with hundreds of highly significant species new to science that had never been collected. Brewer was not stirred by all this in the least. He was an excellent scientific collector in the sense that material was well taken, properly prepared, and properly recorded with field numbers which were tied up with careful field notes. His marked scientific aptitudes in these respects would, however, have been expended with equal zeal and with equally satisfactory results in any other department of natural history or of science to which he might have been assigned.

Endowed with a fine physique and with a stout pair of legs, W. H. Brewer was admirably fitted for mountaineering. His walk-

ing feats astonished many persons, because in Alta California most everyone went horseback. On September 12, 1862, with the Geological Survey party, he climbed to the top of Mount Shasta. The next day he remained at the timberline camp, collecting plants and making barometric observations, until midafternoon. On September 15 and 16, he returned from Sisson to the timberline camp for further barometric observations and incidental plant collecting. A detailed account of his ascent is to be found in his field journal, *Up and Down California*. It is significant that in this narrative of five days spent on the mountain proper he mentions only two plants specifically by name.

Early in 1877, Professor Asa Gray invited Sir Joseph Hooker, Director of the Royal Botanic gardens at Kew and an authority on plant distribution, to join in a tour of the western United States in order to consider various geographic problems. Hooker accepted and a party was made up, sponsored by the United States Geological Survey. At the California line greenbacks were exchanged for gold, because greenbacks were utterly worthless in California, and only gold circulated. By means of gold, visits were made to the Calaveras Big Trees, Yosemite, and some other places, after which, as guests of General John Bidwell of the Ranch Chico, the party, joined on the way by John Muir, proceeded to Sisson in Strawberry Valley. There they met the field equipment of General Bidwell, riding and pack animals, which furnished the means for a comfortable trip up the sides of Mount Shasta to above snowline on September 8, 1877. The collection of plants was rather indifferent. Although Sir Joseph Hooker was an able collector of long experience in India, Australia, and Morocco, it would appear that on this tour collecting was largely left to Asa Gray. Asa Gray is generally considered America's foremost botanist, but he was no collector and he took the slightest possible technical interest in the living plant in the field. Indeed, he seldom collected and his few specimens are generally scanty or fragmentary, and often with incomplete or careless field records. But the party, while on this expedition, saw well a magnificent forest of Shasta Fir and other splendid conifers and thus satisfied, doubtless, their main objective on Mount Shasta.

Next enters John Gill Lemmon. A Union soldier in the Civil War, he came to California broken in health owing to military im-

prisonment in the South, and took up botany by way of outdoor recreation. Not very well trained scientifically, he was nevertheless an enthusiast and studied the native vegetation with great industry and unfeigned delight. In the course of time, as a result of this zeal, he became well acquainted with the conspicuous aspects of the California flora, so that, as he ranged widely over the state, he discovered many plants which he thought to be new. All such presumed discoveries he sent as dried specimens to Asa Gray at Harvard University, who confirmed most of his findings.

With a party of mountain climbers, Lemmon left Sisson Tavern in Strawberry Valley on July 7, 1879, for an ascent of Mount Shasta. He studied carefully the forest on the southerly slopes of the mountain and collected a variety of plants on the way to timberline, where camp was made. The next morning, early, July 10, the ascent of the mountain was begun. Lemmon's vitality was scarcely equal to the strain of effort on the snowfields. "Every few rods," he says, "I was obliged to drop down on my face and rest a few seconds." Farther up, on the higher icy slopes, rest of this sort was not possible, but his determination and fortitude carried him to the summit which was reached at two o'clock. He collected plants both going up and coming down the mountain.

Lemmon's herbarium passed, at his death, to the University of California Herbarium. The specimens are mostly well prepared but field records are often deficient or incomplete.

On August 23, 1881, Cyrus Guernsey Pringle, of Charlotte, Vermont, climbed Mount Shasta to timberline. He was a professional collector who had come to the Pacific Coast in behalf of the American Museum of Natural History in New York City and to act as United States census agent for forests. Later, he became highly distinguished as a botanical explorer in Mexico, an activity continued over many successive years. Pringle's Mexican journals have been published, but I have been informed by Helen Burns Davis, Assistant Curator of the Pringle Herbarium at the University of Vermont, that no California journals have been found. Pringle made excellent specimens accompanied by fine field records, and his Shasta collections were quite the equal, I am sure, of those made in other parts of California. I have, however, at the moment, record of only one of his Mount Shasta plants, namely, *Echinosperrum californicum* (*Lappula californica*), a new species of the

Borage family, published by Asa Gray. This was collected at 6000 feet. Full sets of Pringle's specimens are in the Gray Herbarium, Harvard University, and in the National Herbarium, Washington, D. C.

During the latter part of the nineteenth century, Edward Palmer, an army nurse and physician, collected plants for many years in the arid Southwest, in Mexico, and California. On some day between July 13 and July 27, 1892, he collected on Mount Shasta, but I have no record of the plants which he gathered. Palmer's plants are mainly in the United States National Herbarium and Gray Herbarium.

In the late 1880's, two students at the University of California, Elmer Reginald Drew and Victor King Chesnut, became deeply infatuated with the High Sierra and spent each summer mountaineering. They scaled Mount Lyell, Mount Dana, Lassen Peak and many other peaks at a time when they had the mountains, so far as botanists were concerned, almost to themselves. In July, 1889, they climbed Mount Shasta. Everywhere they went they collected plant specimens, and in this way one can still trace their activities somewhat. Both belonged to the Great and Glorious Society of Sierran Non-Writers; but each radiated eagerly his passion for the mountains by word of mouth. One day in 1892, coming out of old South Hall on the University Campus, I met Chesnut. He stopped me and said, "There's to be a meeting over in town tomorrow to organize a mountaineering club." The next day I went to San Francisco, to Warren Olney's office in the Old Montgomery Block, and there with seven other men signed the articles of incorporation which established the Sierra Club. Chesnut spent his life in the United States Bureau of Plant Industry, in Washington, working on poisonous plants, looking forward eagerly to the rare occasions when he should see again his beloved Sierra. Drew, a life-time professor of physics, in Stanford University, never wholly lost his earlier and deep interest in botanical science.

In July, 1894, a party consisting of Marshall Avery Howe, Walter C. Blasdale, and myself, set up a camp at the Big Spring one mile north from Sisson station and spent several weeks exploring the plateau country about the west base of Mount Shasta. On August third, with a pack animal carrying camp equipment and food supplies, we climbed the well-beaten trail by way of Niel's

Camp to Horse Camp, just above timberline on the south side of the mountain, where camp was made for the night. We rose at two o'clock the next morning, August 4, 1894, prepared a hot breakfast, and started off at once over the snowfields. The climb to the summit was without incident. By half past five the Thumb had been reached and by ten, the summit. There was a little struggle in the last twenty-five feet, but not much. The impressiveness and splendor of the view from the very apex of Shasta holds one for long in spite of the high cold wind at that altitude. The way down to the timberline camp was quickly covered. We had each brought a barley sack and below the precipice slid down a mile and one-half in a few minutes. Above timberline complete collections were made of all the alpine plants in flower and all plants from timberline down through the forest to our base camp near Sisson. In validation of range of species in California, these plants are frequently cited in the volumes thus far published of my *Flora of California*. My journal shows no relation of such hardships as are narrated in W. H. Brewer's journal. The difference is due to this: The writer, a native Californian, was inured to weather, cold, heat, rain, wind, fatigue, from his earliest years. These were things of which one must never—so said one's elders—venture to complain; these were things just a part of the long day's work in the open.

In relation to the problems of plant distribution on the Pacific Coast, Mount Shasta has greater botanical significance than could have been appreciated by botanists in Brewer's day. The presence or absence of alpine and high-montane species on the mountain in relation to the flora of Lassen Peak, the flora of the Salmon Mountains region westward, or the flora of the Cascade volcanic peaks northward, has a deep interest for plant geographers. Exploration of the mountain will continue for long and there will ever be new conclusions formed from a study of its flora as long as there are scientists interested in the geographic distribution of living organisms.

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By Haven Jorgensen

Scenes from the Winter Sierra

A COLLECTION OF SIXTEEN PHOTOGRAPHS





NEAR NORDEN, TAHOE NATIONAL FOREST By Haven Jorgensen



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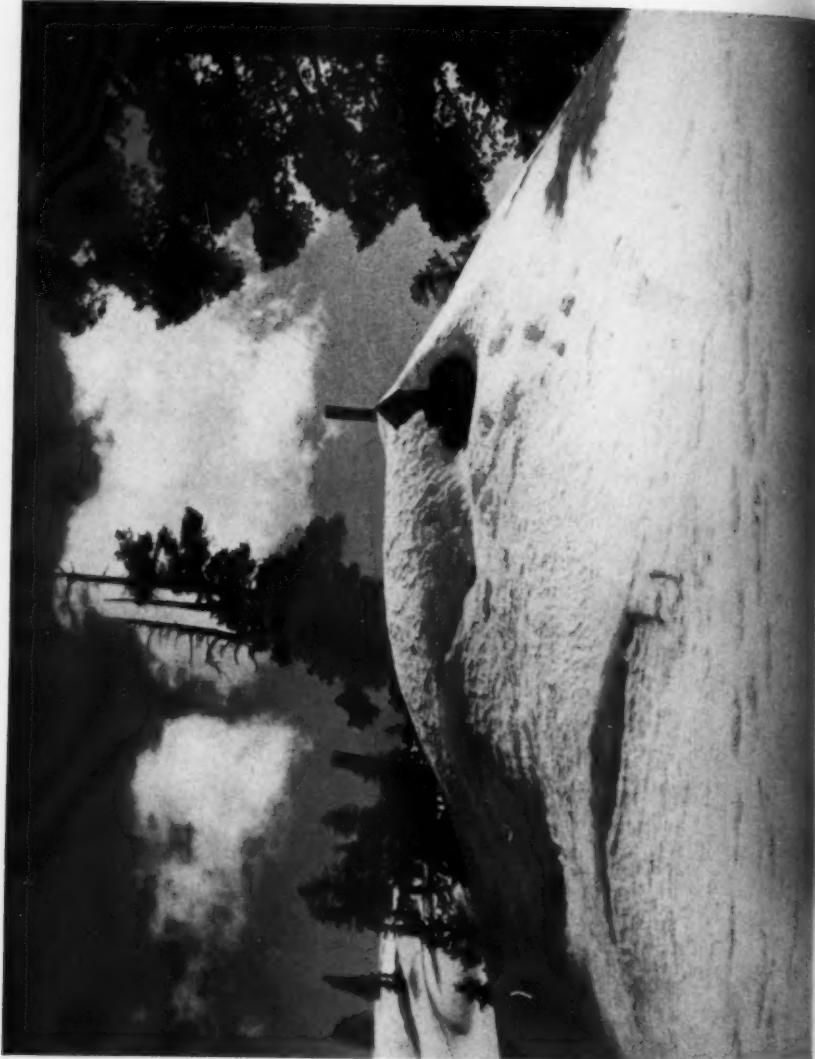
IN THE SUGAR BOWL. By C. Sidney Weitz



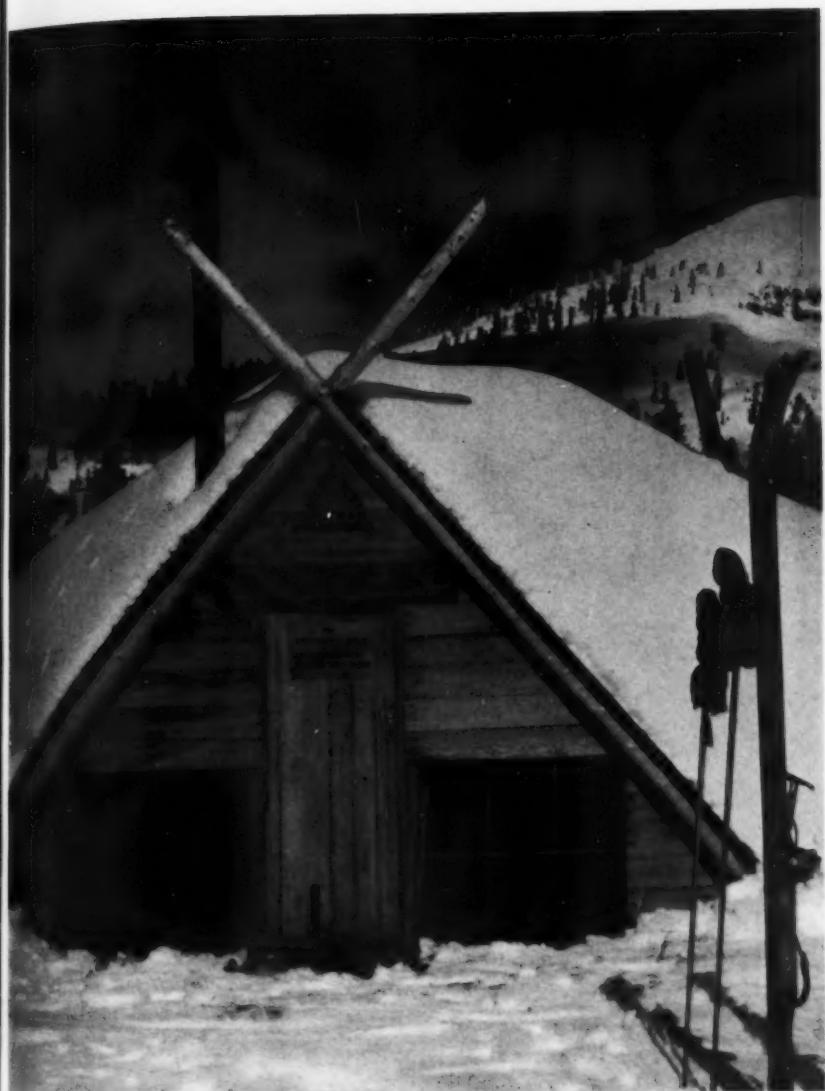
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ENTRANCE, CLAIR TAPPAAN LODGE By Haven Jorgensen



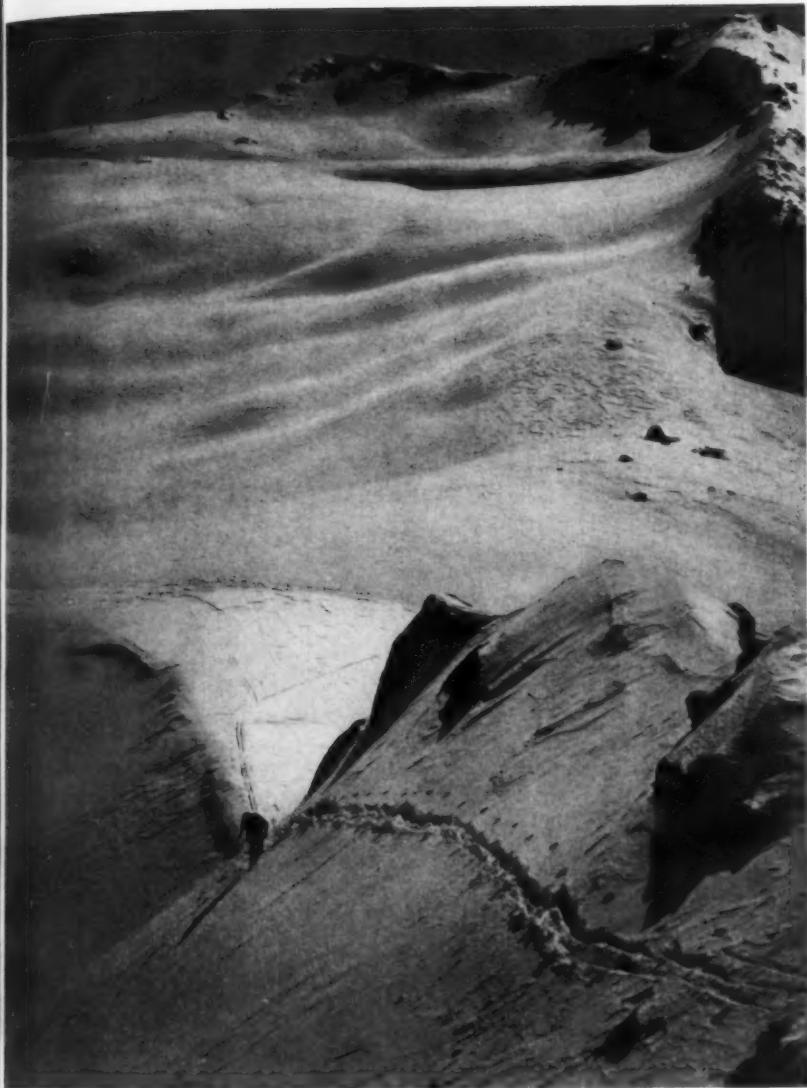
PETER C



PETER GRUBB HUT, SOUTH SLOPE (SECOND FLOOR) By Haven Jorgensen



PEAR L



PEAR LAKE SKI SLOPES By David R. Brower





"DREAM TURNS" BENEATH BEAR CREEK SPIRE By David R. Brower





SOUTHWEST FROM BEAR CREEK SPIRE (APRIL, 1941) By David R. Brower



By Haven Jorgensen



Ducks

BY BLANCHE STALLINGS

YOU can't be on this planet for long without noticing that men have done a lot of rock-piling. All sizes and shapes and kinds are these rocks, and they're piled up for all sorts of reasons—to guide, to protect, to strengthen, to encourage, to enlighten, to inspire.

There's a certain form of this rock architecture that is particularly significant and appealing to the mountaineer. It is undoubtedly one of the simplest forms; withal, it is one that expresses in an entirely adequate and appropriate manner, and with delightful humility and dignity, one of the mountaineer's most useful messages to himself and to his companions—"We went this way." My friends, there it is; there in the midst of nature's sublime and inspiring mountain rock piles; "a man's kindness petrified"—the duck!

"There's a duck!" How frequently that exclamation is heard in the mountains, sometimes on the trail, but more often out beyond the trails in the untracked, shining wilderness.

"There's a duck!" This time the words are breathed with boundless relief and gratitude. "I'm not lost—yet. But oh, it's such slight evidence of anyone's having passed this way. What's beyond? I must see farther before I move. Wait a minute; I can go that far, can't I? Here I am; what's next? Well for goodness sake, there's another duck! That's all I need now. Maybe when I reach that one—yes, there it is. Why this is wonderful—duck by duck."

"There's your duck!" Here the tone confesses surprise. "When you said quite suddenly, about halfway up the peak, 'I think we should build a duck here,' I agreed that it was a splendid idea; but I certainly never expected to see it again. After all, one duck on the mountainside! Of course if we had built a string of them . . ."

"There's a duck!" Ah, there's triumph in that voice—modest, of course. "Well, hadn't everyone in the party been standing there looking for the duck? And even the leader hadn't seen it yet, had she?"

"There's the duck!" Again the oft-spoken words are thought, if not actually spoken, with gratitude. "Thank goodness, I won't have to spend the night looking for my bedsit! What was I thinking of, to camp so far away from everything!"

"There's a duck!" Disappointment is registered in that voice. "Who said this was an unclimbed peak!"

"Ah, there's a—you know, the little men—what do you call them? Ducks, of course. Oh, they are delightful! Look, on top, a fly! Quick, my camera!" The voice is that of an Easterner who's roaming the High Sierra for the first time, breathless at its grandeur, and exclaiming over the "little men" that point out the way.

"There's a duck—and there—and there." Again and again the familiar phrase is uttered, in tones thoughtful, puzzled or merely matter-of-fact. "I guess that means we cross the stream here." "Well, this is where we take off across country." "Why leave the trail here? Oh, there's a view up on that point." "Looks as if we're in for a scramble—the trail's under water." "We'll have to cross this snowfield, apparently."

Ducks, ducks, ducks! Individualistic little rock towers that mark the route of the explorer! Unpretentious little signposts that no mountaineer will pass by thoughtlessly!

Building ducks is a small but vital part of mountain experience, more or less in the same class as making dams and pools in streamlets, or building campfires, or constructing ditch systems to keep rain water out of bedsites that were inadvertently located in dried-up streambeds. The building of a duck may be an individual enterprise; or it may be a group achievement accomplished by a sort of assembly-line process; only instead of the duck's going by the line, the line goes by the duck.

Whenever I see anyone starting to build a duck, I feel inspired to help, hasten to grab the nearest suitable-looking rock, and carry it to the building site. Usually by the time I get there the duck is finished; or if not actually finished, at a stage where small rocks are most appropriate and there I am with a great big rock that refuses to have anything to do with the rock below. Sometimes, though, I



hit it just right; the rock's the proper size and shape, I get it to the scene of action at exactly the right moment, place it on the pile, and it balances obligingly.

On what sort of foundation should a duck be built? So far as I can see, anything that the duck will perch on is all right. Logs and boulders are quite suitable, and besides that they're extremely picturesque. But if there aren't any of these more conspicuous objects lying about, what could be more attractive than a cheerful little duck right out in the grassy, flowery meadow, or on one of those great slabs or slopes of granite? They're useful there too, for it takes a keen eye to detect footprints on granite pavement, or even in the meadows at times.

Likewise, so far as I know, any number of rocks may be used and it doesn't matter how they're put together. One would naturally expect to find the larger rocks near the bottom and the smaller ones above; and often it is so, but not always. Sometimes ducks turn out with the smaller rocks on the bottom or in the middle and huge, heavy rocks on top. That's the exaggerated-overhang idea. Equally striking is the effect of several ponderous rocks topped with a dainty pebble or two. I'm sure that these astonishing results, these miracles of balance, these startling contours are entirely accidental. Maybe that's one of the reasons why ducks are so engaging.

Another point, just in passing—if one sees a duck that is too inconspicuous-looking or that might be mistaken for the work of glacier or avalanche, it is perfectly proper to add a rock or pebble to it, thereby giving it a more definitely ducklike appearance.

Now there are occasions when a duck is built to convey a message of unusual importance. If so, many rocks will be used, for emphasis—a whole heap of them in fact. Then the duck is no longer a duck. It's magnified. It's a monument! Furthermore, if a duck is to mark and celebrate that notable and comparatively rare achievement, a first ascent, not only will many rocks be used, but they will be piled

in a much more impressive, stable, and permanent manner. Here again the duck has ceased to be a mere duck. It's exalted. It's glorified. It's a cairn!



Before we drop the subject of ducks, what about this current demand, at least in the Sierra Club, for some kind of ephemeral route marker; something light that can be carried easily and dropped bit by bit along the way or hung on convenient trees and boulders? Is it a threat to the importance and prestige, if not the existence, of the duck? Oh, it couldn't be! Perhaps the evanescent marker has its place. But as long as we have mountains to enjoy, wilderness to explore, peaks to climb, forests and meadows to wander in, lakes and streams to camp by, trails that get buried under snow and water, and plenty of rocks scattered over everything—don't you really think we'll still have ducks, too?

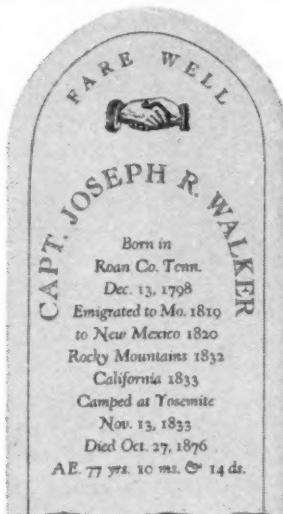


Walker's Discovery of Yosemite

BY FRANCIS P. FARQUHAR

FOR a long time it was generally supposed that the first white men to behold Yosemite Valley were the members of the Mariposa Battalion who pursued a band of Indians to that retreat in March 1851. There is indeed little doubt that they were the first actually to set foot upon the floor of Yosemite and to become extensively acquainted with its wonders. Nevertheless, there is very good evidence that white men saw the valley from its rim nearly eighteen years earlier.

Captain Joseph Reddeford Walker, famous throughout the West for many years as an Indian fighter, trapper, and guide, frequently spoke of having seen the Yosemite when he crossed the Sierra in 1833. In his old age he lived with his nephew, James T. Walker, on a ranch in Contra Costa County, California. There he would often tell of his experiences as a young man when the West was unmapped and all but unknown. He was highly regarded by all who knew him and no one doubted his veracity. So sure was Captain Walker that he had seen Yosemite, that he asked that the event be recorded upon his tombstone. The stone stands today, in the Alhambra Cemetery, Martinez, inscribed as shown here:



When L. H. Bunnell wrote "The Discovery of the Yosemite," first published in 1880, he made but scant mention of Walker's connection with the region, although he evidently had an opportunity to get from Walker himself particulars which would have clarified the story had they been included in his book. Bunnell merely remarks, however, that Chief Tenaya had told him that a

small party of white men once crossed the mountains on the north side of Yosemite Valley, but were so guided as not to see it. This is amplified by a somewhat ambiguous footnote:

Captain Joe Walker, for whom "Walker's Pass" is named, told me that he once passed quite near the valley on one of his mountain trips; but that his Ute and Mono guides gave such a dismal account of the cañons of both rivers that he kept his course near the divide until reaching Bull Creek, he descended and went into camp.

Although Walker's claim was revived from time to time when someone rediscovered the inscription on the tombstone, it appeared to lack supporting evidence sufficient to establish it in the accepted history of Yosemite Valley. It was not until the significance of an obscure book published in 1839 began to be known through quotations of pertinent passages that the tide turned and Walker and his men received their due. While it is now generally held that Walker, or members of his party, saw Yosemite Valley in 1833, there are many differences of opinion about the circumstances of the expedition, especially about the route across the Sierra Nevada. The principal basis for discussion is the book just referred to, *The Narrative of Zenas Leonard*, published in 1839 in Clearfield, Pennsylvania. Very few copies of the original are known to exist, but there are two reprints, as described in the bibliography at the end of this article. Quotations herein are from the Crocker copy of the original, now in the library of the California Historical Society, San Francisco.

Zenas Leonard was born in Clearfield County, Pennsylvania, in 1809. Discouraged at the prospect of producing a living on his father's farm, at the age of twenty-one he went to Pittsburgh and thence to St. Louis, where he engaged as a clerk with a fur-trading expedition to the Rocky Mountains. No further word was received from him at his home and after a time he was given up for lost. Suddenly, in the fall of 1835, after an absence of five years, he turned up at his father's house. He was warmly welcomed by family and friends, who were eager to hear of his adventures. Before returning to Missouri, where he had planned to live, he obliged his friends by writing an account of his experiences. This was begun as a serial in the local newspaper, *The Clearfield Republican*, and, apparently before its completion in that form, was

issued as a book. The editor, D. W. Moore, in his preface to the edition of 1839, gives the following testimonial as to its authenticity:

Our author kept a minute journal of every incident that occurred, but unfortunately, a part of his narrative was stolen from him by hostile Indians; still, however, he was enabled to replace the most important events, by having access to the journal kept by the commander of the expedition. His character for candour and truth, among his acquaintances, we have never heard suspected; and, indeed, among the many who heard the narrative from his own lips, we have yet to hear the first one say they disbelieve it.

With the earlier experiences of Leonard, up to the time of his embarking upon the Walker expedition, we are not at this time concerned; moreover, it appears to have been the journal of the earlier period that was lost. The account of the expedition of 1833-1834 bears every indication of having been written by him with his original notes before him, although there are passages, usually of a descriptive character, which seem to be insertions, and there are a few discrepancies in dates such as might be expected under the circumstances. In all its essentials, however, the narrative rings true. Notwithstanding this, there are certain almost irreconcilable conflicts in the day by day account and in the descriptions of the country, and it is over these that controversies have arisen. It is my opinion that these conflicts are no greater than those to be found in many well-authenticated narratives of exploration and that they do not impair the general credibility of the testimony.

Does Leonard's narrative tell us by what route the Walker party crossed the Sierra and does it substantiate Walker's claim to discovery of Yosemite Valley? I believe it does, especially when supplemented by certain fragmentary statements of others who were members of the party, namely, George Nidever and Walker himself. It is only proper to say that there are those who draw different conclusions from the same data and some of their arguments are very hard to refute. Nevertheless, after a number of years of studying the problem, frequently by reading friend Zenas's pages while seated on some point commanding a comprehensive view of the supposed scene, I venture the following interpretation of the narrative and its corollaries.

Prior to the summer of 1833 Leonard had been with a party of independent trappers; that is, he was not in the employ of one of the

organized companies. Prevented from realizing anything from their efforts because of repeated attacks by Indians, these trappers came to the rendezvous at Green River in July 1833 in the hope of securing engagement with Captain Bonneville, then at the height of his wilderness career. With an augmented force, Bonneville decided to conduct the operations of the ensuing year in three divisions. Over one of these divisions he placed Joseph Reddeford Walker as captain, with instructions, according to Irving, to explore the country surrounding Great Salt Lake, supposed to be watered with well-stocked beaver streams. It was in this division that Leonard found employment as clerk. Leonard's statement of the objects of the Walker expedition differs from Irving's. Leonard declared that Walker "was ordered to steer through an unknown country, towards the Pacific," and that it was because he was "anxious to go to the coast of the Pacific" that he engaged as clerk. George Nidever, another trapper, also stated that he joined Walker's party with the express purpose of going to California. These men certainly knew of Jedediah Smith's travels and those of Peter Skene Ogden, and they must have been aware that the country immediately west and south of Great Salt Lake was destitute of beaver. There would seem to be little doubt, therefore, notwithstanding Irving's statement, that from the beginning Walker's destination was the Pacific Coast and that this objective had Bonneville's sanction.

"Mr. Walker was a man well calculated to undertake a business of this kind," says Leonard. "He was well hardened to the hardships of the wilderness . . . understood the character of the Indians very well . . . was kind and affable to his men, but at the same time at liberty to command without giving offence . . . and to explore unknown regions was his chief delight." Although but thirty-five years of age, he was already a veteran of the frontier. Irving describes him as:

About six feet high, strong built, dark complexioned, brave in spirit, though mild in manners. He had resided for many years in Missouri, on the frontier; had been among the earliest adventurers to Santa Fé, where he went to trap beaver, and was taken by the Spaniards. Being liberated, he engaged with the Spaniards and Sioux Indians in a war against the Pawnees; then returned to Missouri, and had acted by turns as sheriff, trader, trapper, until he was enlisted as a leader by Captain Bonneville.

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On the 24th of July, 1833, the party, comprising some fifty men, left the Green River rendezvous and soon came to Great Salt Lake. "We left the Lake," says Leonard, "and took a westerly course into the most extensive & barren plains I ever seen." Reaching the source of the Humboldt River, which they called Barren River, they followed its course down to the lakes at its mouth. "These lakes are all joined together by means of the river which passes from one to another, until it reaches the largest, which has no out-let." This statement by Leonard locates Walker's party definitely at the sink of the Humboldt.

From this point the narrative, while full of particulars, does not enable us to follow the route with precision.

On the 10th of October [says Leonard] we left these Indians and built rafts out of rushes to convey us across the river, when we left the Lakes and continued our course in the direction of a large mountain, which was in sight, and which we could see was covered with snow on the summit. In the evening we encamped on the margin of a large Lake formed by a river which heads in this mountain. This lake, likewise, has no outlet for the water, except that which sinks into the ground. The water in this lake is similar to lie, and tastes much like pearl-ash. If this river was in the vicinity of some city, it would be of inestimable value, as it is admirably calculated to wash clothes without soap, and no doubt could be appropriated to many valuable uses. There is also a great quantity of pumice stone floating on the surface of the water, and the shore is covered with them. The next day we travelled up this river towards the mountain, where we encamped for the night. This mountain is very high, as the snow extends down the side nearly half way—the mountain runs North and South.

A great deal depends upon the interpretation of this description. It has been contended that the lake referred to was Mono Lake. The matter of pumice has been argued. Others hold it to have been Carson Lake. Perhaps a description of one place was lifted out of order and applied to another. The only conclusion I can draw is that the narrative at this point has not brought the party as far south as Mono Lake. The subsequent descriptions do not fit a crossing by way of Bloody Canyon, Leevining Creek, the vicinity of Sonora Pass, or any route north of that point. They do, however, fit very well another interpretation, namely, that the party entered

the Bridgeport Valley and approached the mountains by way of one of the branches of East Walker River.

Let us, therefore, return to the narrative. They were now in full sight of the Sierra Nevada, apparently after an early season storm had spread a new mantle of snow over its summits. In the morning they despatched hunters to the mountains to search for game and at the same time to look for a pass, but without success in either objective. Again they sent out scouting parties to search out a pass; this time Captain Walker, Nidever, and Leonard went together. Upon the return that evening, one of the scouting parties reported the finding of an Indian path that appeared to lead over the mountain.

Accordingly, at an early hour the next morning we started on our journey along the foot of the mountain in search of the path discovered on the previous day, and found it. On examination we found that horses travelled it, and must of course come from the west. This gave us great encouragement, as we were very fearful we would not be able to get our horses over at all. Here we encamped for the night. In the morning we started on our toilsome journey. Ascending the mountain we found to be very difficult from the rocks and its steepness. This day we made but poor speed and encamped on the side of the mountain.

Oct. 16. Continued our course until in the afternoon, when we arrived at what we took for the top, where we again encamped, but without anything to eat for our horses, as the ground was covered with a deep snow, which from appearance, lays on the North side of the peaks, the whole year around.

The account that follows is of more than ordinary interest, for, besides affording a clue to the route, it presents the first descriptions ever published of some of the principal features of the High Sierra. Moreover, it describes the first of a long series of desperate efforts to force a passage across the range through heavy snow. Frémont, the Donner party, and many another group were soon to experience similar hardships among these mountains—a region which can be so delightfully hospitable in summer and so ferocious in winter.

Cold, hunger, and fatigue now attacked the trappers in earnest.

The next morning it was with no cheerful prospect that each man prepared himself for travelling, as we had nothing to eat worth mentioning. As we advanced, in the hollows sometimes we would encounter prodigious quantities of snow. When we would come to such places, a certain portion of the men would

be appointed alternately to go forward and break the road, to enable our horses to get through; and if any of the horses would get swamped, these same men were to get them out. In this tedious and tiresome manner we spent the whole day without going more than 8 or 10 miles. . . . This day's travel was very severe on our horses, as they had not a particle to eat. They began to grow stupid and stiff, and we began to despair of getting them over the mountain. We encamped this night on the south side of one of these peaks or ridges without any thing to eat, and almost without fire.

Some of the men became unmanageable and wanted to return home, in spite of the almost certain death that would have attended such an attempt. The only thing that brought them around to a more reasonable view of things was the butchering of two decrepit horses. Some of the men "eat as much and as eagerly of this black, tough, lean, horse flesh, as if it had been the choicest piece of beef steak."

In the morning, after freely partaking of the horse meat, and sharing the remainder to each man, we renewed our journey, now and then coming onto an Indian path, but as they did not lead in the direction we were going, we did not follow them—but the most of the distance we this day travelled, we had to encounter hills, rocks and deep snows. The snow in most of the hollows we this day passed through, looks as if it had remained here all summer, as eight or ten inches from the top it was packed close and firm—the top being loose and light, having fell only a day or two previous. About the middle of the afternoon we arrived at a small Lake or pond, where we concluded to encamp, as at this pond we found a small quantity of very indifferent grass, but which our horses cropped off with great eagerness. Here we spent the night, having yet seen nothing to create a hope that we had arrived near the opposite side of the mountain—and what was equally as melancholy, having yet discovered no signs of game.

The next morning we resumed our labour, fortunately finding less snow and more timber, besides a number of small lakes, and some prospect of getting into a country that produced some kind of vegetation. The timber is principally pine, cedar and red wood, mostly of a scrubby and knotty quality.

Probably juniper trees of different forms and sizes were mistakenly given the names of cedar and redwood, for they had not yet reached the zone of the giant sequoia.

After travelling a few miles, further however, than any other day since we had reached the top of the mountain, we again encamped on the margin of another small lake, where we also had the good fortune to find some pasture for our horses. This evening it was again decided to kill three more of our horses which had grown entirely worthless from severe travelling and little food. The next morning several parties were despatched on search of a pass over the mountain, and to make search for game; but they all returned in the evening without finding either. The prospect at this time began to grow somewhat gloomy and threaten us with hard times again. We were at a complete stand. No one was acquainted with the country, nor no person knew how wide the summit of this mountain was.—We had travelled for five days since we arrived at what we supposed to be the summit—were now still surrounded with snow and rugged peaks—the vigour of every man almost exhausted. . . .

From the statements just quoted it is clear that Walker had no Indian guides with him; so Bunnell was evidently mistaken when he said that Walker's guides warned him of the deep canyons. Had Walker known of the deep canyons at this time he would certainly have made every effort to reach them. But, as will presently appear, he came upon them without any previous knowledge of their existence.

It seems extremely probable that the party had been floundering about the intricate maze of canyons north of the main Tuolumne River. In no other place would they have encountered the particular type of obstacles described, and in no other place would they have extricated themselves in the way they did. If they had crossed the summit at the head of the American, the Mokelumne, or the Stanislaus, they would have found the way constantly improving, and their principal difficulty would have been in getting out from the bottoms of densely wooded canyons far below the snow-line. If they had struck the Dana Fork of the Tuolumne, the way would have been easy at once. But, if they had ascended one of the branches of the East Walker River they would have encountered the very difficulties described, and they would have been forced to turn south and southwest to cross the Tuolumne and to pass over the low divide into the basin of the Merced River.

There is other authority for this supposition. Under date of September 1, 1877, there appeared in the *San Jose Pioneer* a sketch of Walker's career written by the editor, who had interviewed Walker

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shortly before his death in 1876. In this sketch occurs the following passage:

His first attempt to descend to the West was near the headwaters of the Tuolumne, which he found impossible, but on working a little to the Southwest he struck the waters of the Merced and got into the Valley of the San Joaquin. His was the first white man's eyes that ever looked upon the Yosemite, which he then discovered, although the honor has been given to some other person at a period twenty years later.

In our supposition, then, we may picture Walker and his men, in a desperate effort to extricate themselves, abandoning the attempt to force a way due westward through the maze north of the Tuolumne Canyon, and momentarily turning southward. Thus they would have come almost immediately into easier going, although still far from finding a way out of the mountains. With this hypothesis, it is not difficult for one familiar with the topography between Yosemite Valley and the Tuolumne Canyon along the route of the present Tioga Road, to visualize the movements of Walker and his starving band as described in the following passages from Leonard's narrative:

We travelled a few miles every day, still on the top of the mountain, and our course continually obstructed with snow hills and rocks. Here we began to encounter in our path, many small streams which would shoot out from under these high snow-banks, and after running a short distance in deep chasms which they have through ages cut in the rocks, precipitate themselves from one lofty precipice to another, until they are exhausted in rain below.—Some of these precipices appeared to us to be more than a mile high. Some of the men thought that if we could succeed in descending one of these precipices to the bottom, we might thus work our way into the valley below—but on making several attempts we found it utterly impossible for a man to descend, to say nothing of our horses. We were then obliged to keep along the top of the dividing range between two of these chasms which seem to lead pretty near in the direction we were going—which was West,—in passing over the mountain, supposing it to run north & south.

The vicinity of Yosemite Valley is the only place in the Sierra that corresponds to this description, and no one could have written these words in the year 1839 who had not himself beheld the scene. We can almost determine the very spot from which Walker and his men

gazed upon it, for it would have been the most natural thing in the world for them to come to the brink where Yosemite Creek "precipitates itself from one lofty precipice to another, until exhausted in rain below." We can picture these trappers on that October day, looking down into the depths of the valley, pausing for a few moments, jaded as they were, to contemplate in awe and admiration this unique marvel of nature.

Leonard says that they kept along the divide between two such chasms. From this we may infer that they followed the natural route of the present road, scouting to the right as well as to the left. On the right, the scouts would have reached more than one point overlooking the Tuolumne Canyon, and they could hardly have failed to see Hetch Hetchy.

Unable to find a way down the precipices, still in ignorance of how far they had to travel to get across the range, every man in the party was now thoroughly discouraged and downcast. There was great rejoicing, therefore, when one of them brought into camp a basket of acorns. "These nuts our hunter had got from an Indian who had them on his back travelling as though he was on a journey across the mountains, to the East side.—When the Indian seen our hunter he dropped his basket of provision and run for life."

This was on the 25th of October, according to Leonard, and while some of Leonard's earlier dates are badly mixed up, in this he was very nearly, if not entirely correct. More than two weeks later, while the party was encamped near tidewater at the mouth of the San Joaquin, there was a remarkable shower of meteors, and it is known that this display occurred on the 12th of November, 1833. The date, November 13th, on Walker's tombstone is, therefore, wrong.

Walker was now on one of the main Indian trails across the mountains—the route used by the California valley Indians and the Monos in trading back and forth, exchanging acorns for pine nuts, obsidian, and salt. The troubles of the starving band were, for the time being at least, very nearly at an end. They still found snow in abundance, but their course was not so badly obstructed with rocks as formerly.

In two or three days we arrived at the brink of the mountain. This at first was a happy sight, but when we approached close, it seemed to be so near perpendicular that it would be folly to attempt a descent. . . . Here we encamped for the night, and

sent men out to discover some convenient passage down towards the plain—who returned after an absence of a few hours and reported that they had discovered a pass or Indian trail which they thought would answer our purpose, and also some signs of deer and bear, which was equally as joyful news—as we longed to have a taste of some palatable food. The next morning after pursuing our course a few miles along the edge of the mountain top we arrived at the path discovered by our men, and immediately commenced the descent, gladly leaving the cold and famished region of snow behind. The mountain was extremely steep and difficult to descend, and the only way we could come any speed was by taking a zigzag direction; first climbing along one side and then turning to the other, until we arrived at a ledge or precipice of rocks, of great height, and extending eight or ten miles along the mountain—where we halted and sent men in each direction to ascertain if there was any possibility of getting over this obstruction. In the afternoon of the same day our men returned without finding any safe passage thro' the rocks—but one man had succeeded in killing a small deer, which he carried all the way to camp on his back—this was dressed, cooked and eat in less time than a hungry wolf would devour a lamb.

Finding no better way, they determined to descend over the rocks. The horses were let down, one at a time, by ropes, luckily without injury, and soon the whole party were encamped among green oak bushes. The hunters brought in two deer and a bear, and: "This night we passed more cheerful and in better heart than any we had spent for a long time."

Let us continue with Walker a little longer until he and his companions have left the mountains and have emerged upon the plains of the San Joaquin Valley, for in doing so we shall see that they have made another discovery, quite as remarkable and just as unnoticed by early historians as was their discovery of Yosemite.

In descending the mountain this far we have found but little snow, and began to emerge into a country which had some signs of vegetation—having passed thro' several groves of green oak bushes, &c. The principal timber which we came across, is Red-Wood, White Cedar and the Balsom tree. We continued down the side of the mountain at our leisure, finding the timber much larger and better, game more abundant and the soil more fertile. Here we found plenty of oak timber, bearing a large quantity of acorns, though of a different kind from those taken from the Indian on the mountain top. In the eve-

ning of the 30th we arrived at the foot or base of this mountain —having spent almost a month in crossing over. . . . In the last two days travelling we have found some trees of the Red-wood species, incredibly large—some of which would measure from 16 to 18 fathom round the trunk at the height of a man's head from the ground.

In the passage just quoted we have, unquestionably, the first description of the Big Tree (*Sequoia gigantea*). The insertion of the name "Red-wood" was probably made by Leonard when he prepared his journal for publication, as the term could hardly have been known to him until his visit to the coast after crossing the Sierra. But that he saw the true Big Tree on this occasion is beyond doubt; the measurement of 16 to 18 fathoms could hardly have been invented, as no other tree has such a girth. Moreover, if the party took the course that we have assumed, they would almost certainly have passed through either the Merced Grove or the Tuolumne Grove—not the Mariposa Grove, on the other side of the Merced Canyon, as has sometimes been asserted.

It would be interesting to continue with Walker's party across the San Joaquin Valley to San Francisco Bay, thence to the ocean, where they found an American ship, and finally to Monterey. But as our interest for the moment lies mainly with the Sierra Nevada we shall turn the pages of the narrative until we come again to the mountains on the return trip.

When Walker left the Spanish settlements of California in the month of February to meet his engagement with Captain Bonneville at the summer rendezvous of 1834, he had no desire to repeat his experiences among the rocks and cliffs and snows of the Sierra. He had probably learned from the Spaniards that he could cross the mountains at the head of the Tulare Valley, although they doubtless had in mind a route over the Tehachapi and through the Mohave Desert. At all events, with 52 men, 315 horses, 47 beef, and 30 dogs he crossed to the San Joaquin, and on the 27th of February "arrived at the base of the (Calafornia) mountain."

With Zenas Leonard still in the company as chronicler, the party continued south in search of pasture for the cattle and a convenient pass over the mountain.

The Indians were quite numerous, some of whom would at times manifest the most unbounded alarm. We also passed a great number of streams flowing out of the mountain, and

stretching afar towards the Pacific. The prairies were most beautifully decorated with flowers and vegetation, interspersed with splendid groves of timber along the banks of the rivers—giving a most romantic appearance to the whole face of nature.

From some Indians near Kern River, Walker learned of a pass over the mountains near by and hired two of the Indians to go with him as pilots.

In the morning we continued up the mountain in an eastern direction, and encamped this evening at the lower end of the snow. The next day we found the snow more plenty, and encamped without grass of any kind. We now began to apprehend hard times again. Our horses no longer resumed their march in the mornings with a playful cheerfulness, but would stumble along and go just when their riders would force them to do so. We continued travelling in this way for four days when we landed safely on the opposite side of the mountain, in a temperate climate, and among tolerable pasture, which latter was equally as gratifying to our horses as the former was to the men.

This episode marks the discovery of Walker Pass, at the southern extremity of the Sierra Nevada, crossed today by an automobile highway. Having found this comparatively easy route over the mountains, Walker remembered it for future use; he took the Chiles immigrant party that way in 1843, and guided a division of Frémont's party into California by the same route in 1845.

Walker was now in the Owens Valley, but the descriptions given by Leonard are not specific enough to disclose the precise route from the foot of Walker Pass to the junction with the outbound trail of the preceding October. The party travelled slowly on account of the weakened condition of the animals, for the country was almost devoid of grass. "Travelling along the eastern base of this (California) mountain," says Leonard, "we crossed many small rivers flowing towards the east, but emptying into lakes scattered through the plain, or desert, where the water sinks and is exhausted in the earth." These are the streams that now are captured by the Los Angeles aqueduct.

Ignorant of the danger they were incurring, the Walker party left the base of the Sierra for a time, hoping to find a short-cut toward Great Salt Lake. After barely escaping with their lives from the arid desert, they turned back toward the Sierra, and came at last to

the point where they had started across it in the fall. Rejoicing to find themselves on familiar ground, they made rapid progress up the Humboldt and passed out of the story of the Sierra Nevada.

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The Colorado is Still Wild

BY WELDON F. HEALD

DORIS Nevills says, "to talk with Norm is to take a trip." Like most wives, she knows her husband. It happened to me; I talked with Norm and took a trip—down the Colorado River!

Doris and Norman Nevills live up on the San Juan at Mexican Hat, Utah, where they have a private navy of eighteen boats. Boats are Norm's life, rivers his religion. They are in his blood. But the Colorado is Norm's great love. No man knows it better.

I first met Norm Nevills by chance last April under the towering stone arch of Rainbow Bridge. We talked for ten minutes. In May I received a characteristic telegram from him.

"Decided to shoot the Colorado for the third time," it read. "Want another member to fill out crew and share expenses. This is not a 'dude' trip but definitely to get pictures and work a kayak through for first time. Will be a grand trip. How about it?"

So two months later, instead of scrambling around Sierra summits, I found myself hanging to a fifteen-foot cataract boat as it plunged and reared down through the first rapid. A mountain cony turned river rat.

But, as Doris says, "to talk with Norm is to take a trip."

Although the Colorado is one of the great rivers of the continent, it differs completely from all the others. Our rivers have been pathways of exploration, arteries of travel, highways of commerce. They have contributed to the development of the country. The Colorado alone, for 400 years, has stood like a barrier across the Far West, preventing expansion, hampering travel, detouring commerce far to the north and south. It flows through a land which, even today, is the West's last great wilderness. For a stretch of 1500 miles only five bridges cross it. Hundreds of square miles yet remain where the Colorado roars down through lonely canyons 5000 feet deep exactly as it did in the days of the Spaniards—muddy, sullen, inhospitable, treacherous.

Discovered in 1539 by Ulloa and crossed by Father Escalante in 1776 near what is now Lees Ferry, Arizona, the mysterious "Colorado River of the West" remained practically unknown until 1869.

In that year Major John Wesley Powell began the first expedition by boat through all the canyons of the Colorado from Wyoming to California. Powell was followed by others. Some were successful, many were not. A few were never heard from again. The river is lined with broken oars, mouldering boats, even an occasional skeleton—mute evidence of those who didn't make it.

Nevills' 1941 Colorado River Expedition was the seventeenth successful party to make the passage of Marble and Grand canyons in the seventy-two years since Powell's first trip. It was unusual in at least three ways: first, a kayak navigated the 200 worst rapids on the Colorado; second, the party came through without an accident or mishap of any kind; third, one of the members was a woman.

We pushed off from Lees Ferry July 15, on our 400-mile journey to Boulder Dam. There were six in the party. Norm, with Agnes Albert, of San Mateo, led in the flagship, *Wen*. Dell Reed, Norm's neighbor from Bluff, Utah, Bill Schukraft, of Chicago, and I, followed in the *Mexican Hat II*. Our third boat, the seventeen-foot kayak, was piloted by Alexander E. Grant, a member of the Appalachian Mountain Club, from Dedham, Massachusetts. W. E. N. were Norm's father's initials, but the "II" attached to our boat looked ominous. I never dared ask what became of the *Mexican Hat I*.

Eight miles below Lees Ferry came the first test—Badger Creek Rapid.

Badger Creek is a typical Colorado River rapid, but it was my first. There wasn't a thing about it I liked. A more unhealthy spot in which to be in a boat I couldn't imagine. My enthusiasm for the Colorado reached absolute zero.

To run Badger Creek Rapid you have to hit the triangular tongue squarely in the middle; otherwise you get into trouble. To the right the water curls over a submerged rock into a hole fifteen feet deep. On the left is a raging welter of water in which the least that can happen is an upset boat. The catch is that you can't see the tongue from above. You have to guess.

Norm guessed right. Guided by Dell's signals, he brought the *Wen* through. Next Dell ran the *Mexican Hat* down on Norm's signals. There were two down, one to go.

It was Zee's turn. Would he make it? We were afraid we knew the answer.

Norm stood silhouetted high on a boulder, ready to signal. Dell

stayed by his boat a quarter of a mile below, waiting. The rest of us perched above the roaring water, cameras set.

Zee pushed out from shore in his sixty-pound, canvas-covered craft. He paddled slowly to midstream, looking warily ahead. If any human was capable of shooting the man-eating rapids of the Colorado in a kayak, Zee Grant was. After winning most of the Eastern white-water championships he descended the Green River in 1939 and the following summer ran the Middle Fork of the Salmon, a branch of Idaho's "River of No Return." But the Colorado is something else again. All expert rivermen, including Norm himself, shook their heads. The verdict was unanimous. It just couldn't be done.

Zee came on, his double-ended paddle dipping rhythmically. Norm on his rock signalled with upraised hand: *a little to the right . . . that's it . . . hold it . . . No, no, not so far . . . pull left!* Norm's hand waved vigorously now: *Back! Back!*

Zee had slipped too far to the right. He was directly in line with the hole. We could see. He couldn't. The kayak reached the brink. Zee saw his mistake. He back-paddled valiantly, but—too late. The kayak balanced for a moment, tipped forward and plunged into the hole. Instantly it was swallowed up by the angry, surging water.

We stared in helpless fascination at that empty, gaping hole. Seconds that seemed minutes dragged by before the kayak's blue prow rose from the spouting foam. That broke the spell. Norm shouted something that was drowned in the roar of the rapid. Bill started down the shore, leaping from rock to rock, in an effort to join Dell who was pushing out in the *Mexican Hat*. For the kayak had shot to the surface—upside down! It hurried through the giant waves, bounding and swaying, but there was no sign of Zee.

A quarter of a mile below a black dot appeared, bobbing in the rough water close to the fleeing kayak. Dell, straining on his oars, hadn't a second to spare. A rope whipped out from the *Mexican Hat*, the black dot merged with the kayak, and we saw Zee astride his upset kayak being towed to shore behind the cataract boat.

When we reached him he was pretty well shaken up, but no more so than the rest of us. The very first day tragedy had come too close! Nobody knows how long Zee Grant was under water. Probably twenty-five seconds, possibly forty-five. But he never would have come out alive if he hadn't had presence of mind to press the lever

on his spare carbon dioxide life preserver. This shot him to the surface where he had a chance to fight for his life.

One more hurdle remained before we could make our first camp. Soap Creek Rapid was reputed to be bad medicine. It looked it. Two and a half miles below Badger Creek the river takes off in confused masses of spray ending half a mile below in a series of great, arching waves resembling the wake of a giant paddle-wheeler. Norm suggested to Zee that perhaps it would be wiser to line the kayak around the rapid, but Zee shook his head.

"They'd all get me if I quit now," he said. "I've got to run it."

Without another word he studied the rapid, watched the cataract boats go through, then deliberately shot the kayak down the tongue into the heaviest water, dodging, turning and twisting through the waves with the dexterity of an all-American broken-field runner. He landed below the rapid, upright, with a wide grin on his face.

"Will one of you pull the kayak ashore," called Zee. "I don't want to get my feet wet."

That night we camped in a sandy cove below Soap Creek. With the first cup of hot soup the strain of the past few hours dropped away. A feeling of elation came over us. We had cheated the river that day. There were still six of us.

Zee had two more spills, but he quickly learned the knack of taking his light craft through the heaviest water. By running every rapid along with the cataract boats he showed the experts that they still had something to learn about white-water boating.

Taking a kayak through was a spectacular stunt requiring skill and courage; but it would never have been accomplished without the coöperation of a well-organized party, which included two of the most experienced rivermen who ever shot a rapid. The widespread newspaper publicity reporting Zee Grant as making a solo run was unfortunate, as it is apt to encourage other fold-boat enthusiasts to almost certain suicide.

The real backbone of the expedition was the two cataract boats. The *Wen* and *Mexican Hat II*, twins, identical in construction, were specially designed for Colorado River travel. Sixteen feet long, five wide, they are sturdy, flat-bottomed boats with pointed bows and squared sterns. Each weighs 600 pounds when empty, double that loaded. Their frames are of Louisiana white oak covered with 9/16-inch marine plywood in single, unbroken sheets. Each boat has

seven watertight compartments which make it unsinkable. Two of these, roomy hatches fore and aft, served as storage space for the entire party's dunnage and equipment. The boats are handled with oars weighing twelve and a half pounds apiece. The *Wen*, having made a record of three trips down the Colorado, now rests comfortably in the Park Service Museum at the Grand Canyon. After a lively and useful life it will pass an honorable old age beside the historic Powell and Stanton boats.

Badger and Soap Creek rapids were samples of what was to be our daily fare; each day we shot ten to fifteen rapids, some big, others small, no two alike and none monotonous.

Cataract boats are run backward through rapids. In this way the boatman can see where he is going and make every stroke of the oars count pulling against the current. The lighter the boat the easier it is to handle. So in the most dangerous rapids one man takes a boat through alone. When passengers are carried, one sits in the fore part of the cockpit behind the oarsman, also facing the rapid, while the other rides the flat afterdeck. Stern foremost means that the second passenger takes the brunt of every wave. There is no perfect method for spreading a six-foot man over a three by four space, so each passenger evolves his own system. Mine was to flatten myself, face down, into the smallest space possible, get an unshakable grip on the safety ropes, and hope for the best.

Fourteen miles was the average daily run, but on several occasions we made as much as twenty-five. The river was at an ideal stage for making distance with a minimum of rowing, the current, even between rapids, carrying us along at a five- to eight-mile clip.

Each noon we landed for lunch at some shady spot under a cliff or mesquite tree. Lunch was invariably followed by an hour's siesta. I never understood the sequence exactly: Norm filled us with a "balanced ration" alive with lettered vitamins; five minutes later we were stretched out flat, sound asleep.

Good campsites are not numerous along the Colorado, but each night we managed to find a sandy beach or flat ledge with firewood near by. Whenever possible we tried to pick a camp close to one of the rare mountain streams which come cascading down the narrow side canyons every forty miles or so. Although the muddy, brown Colorado River water is drinkable, a taste for it must definitely be acquired. "Even washing in that stuff is like throwing handfuls of

mud at yourself," said Bill disgustedly. Arizonans say that the Colorado is too thick to drink and too thin to plow. It is estimated that the river carries a half million tons of silt past a given point every twenty-four hours—enough material to fill 200 freight trains of 100 cars each! The water leaves a reddish brown coating upon everything it touches, while its tendency to load one down with silt makes an upset so dangerous that we wore our kapok life jackets most of the time while on the river.

"You're going to be wet ninety per cent of the time," Dell warned us at the start. He erred on the conservative side. The party became practically cetacean—or amphibian if one were to consider the land that was mixed with our water. Although we soon were completely indifferent to the repeated soakings we received in every rapid, one of the most satisfactory luxuries of the trip was a change to dry clothes at the end of the day.

But being constantly wet had its practical side. A merciless summer sun beats down into the barren canyons, sending midday temperatures aloft to 110-118°, but as we were air-cooled by evaporation all day long none of us suffered from the heat while on the river. In fact, when the sun disappeared behind high-piled thunderclouds which gathered on the canyon rims each afternoon, we actually became cold. Once, during a thunderstorm, we just couldn't take it, so landed, built a fire, and huddled around it, with teeth chattering.

For four days we threaded the sixty-mile length of Marble Canyon and at Nankoweap entered Grand Canyon National Park. We spent a day at Nankoweap, scrambling in the blazing heat to the little-known Indian ruins perched high on a cliff, 450 feet above the river. We also explored the sites of ancient villages along the creek, picking up broken pottery, arrowheads, and implements dating from the Pueblo II period 700 to 800 years ago.

We were puzzled by a crumbling stone corral standing on a hill by the river. Later we found that in the eighties Nankoweap was headquarters for a band of rustlers. They stole horses in southern Arizona and New Mexico, drove them across the Grand Canyon, eventually selling them in the Mormon towns to the north. When this profitable venture broke up, the rustlers didn't live long to enjoy their prosperity. Every member of the gang suspected the rest.

They tracked each other all over the Southwest, shooting on sight, in a mutual annihilation modern gangsters might envy.

At Tanner Creek, sixteen miles below Nankoweap, we were ready to tackle the Grand Canyon. Marble Canyon had been a curtain raiser; now the main show was to begin. That night we set a huge pile of driftwood ablaze, a prearranged signal to the watchers at Desert View tower that so far all was well.

The introduction to the Grand Canyon is dramatically sudden. Between Tanner and Bright Angel creeks are the three worst rapids on the Colorado—Hance, Sockdolager, and Grapevine. The last two have a particularly evil reputation because black, precipitous walls hem them in. There is no way to walk around them and no method by which a boat can be lined from their rugged shores. All who come down the river must run Sockdolager and Grapevine.

There is a tingling feeling of suspense about running big rapids, half anticipation, half dread. But on the morning of the Big Day the entire party felt the strain of uncertainty. We had a healthy respect for what was before us.

It was justified! I have kaleidoscopic memories of drenching, breathless moments in swirling furies of water; wicked-looking holes guarded by curling walls of foam; yawning whirlpools spinning by. The heavy artillery of the Colorado was let loose on us that day. But we got through. At four thirty in the afternoon the expedition landed at Bright Angel Creek after the most thrilling twenty miles the river has to offer.

Phantom Ranch lies at the bottom of the Grand Canyon close by clear, sparkling Bright Angel Creek. We spent two days there making the most of our one contact with civilization. The six of us reveled in the Sybaritic pleasures of soft beds, cold drinks, showers, and a swimming pool.

At Phantom Ranch Doris Nevills met us with some mountainous stacks of provisions.

"You can't run the Colorado onhardtack and beans," says Norm. Quantity and variety are his two theories about eating. And so we enjoyed such rare delicacies as fresh bread and eggs throughout the trip. Several hours were required to pack all the food and stow it in the hatches of the cataract boats. They were groggy from weight when we pushed off from the beach at Phantom Ranch.

Somehow it seemed as if the trip really began after leaving Bright

Angel Creek. For ten days we would be isolated at the bottom of one of the world's great gorges. But we six were finally a working unit ready for anything the canyon might offer.

And we found, soon enough, that the canyon meant business. At Hermit Falls, six miles below Phantom Ranch, we had our first lining job. There the river drops too fast even for spunky cataract boats to dare the thirty-foot waves. Lining is an arduous task, sometimes taking three hours before the last boat is through.

In lining, everything movable in the boats must be unloaded and portaged to the foot of the rapid. Then, with every man pushing and pulling with all his strength, the boats are eased down over boulders and cascades through narrow channels close to the shore. As the boats haltingly progress they are snubbed, first with the bow line, then the stern line, to prevent them from being whisked away by the current or smashed against a rock.

Lining is slow work, but exciting. The channels are deep and swift while the footing is slippery, glasslike rock protruding from the water at all angles. Fortunately for our aching muscles, Lava Falls, a hundred miles below, was the only other rapid we were forced to line.

Day after day we traveled down the endless trench of the Grand Canyon, titanic, unscalable walls closing us in from the outside world. Our horizon became vertical; we were in a land of shadows where the sky was but a strip of blue overhead. We speculated on what would become of us if we lost the boats. Food might be dropped from planes. But could we get out? In places a well-equipped climbing party could make it, but most Grand Canyon cliffs will wait forever for first ascents.

Almost every afternoon storms came up with tropical suddenness. Torrential rains poured into the canyon, obliterating everything. Lightning flashed. Thunder crackled and reverberated above the roar of the river. We would hurriedly pull for the shore to find what shelter we could.

Everything about these storms was like the canyon itself, savage and magnificent. Loose stones clattered incessantly down the cliffs. Boulders bounded down the walls and plunged into the river. One, the size of an army tank, struck the water with an ominous hiss not 500 feet from us.

These storms ceased as suddenly as they began. Then gossamer

cascades appeared against the wet cliffs, shining in the sun. But the finest waterfalls we saw were near Havasu Creek. There we passed between vertical walls 2000 feet high lined on both sides with twenty to thirty waterfalls, grand and beautiful. They seemed especially created for our benefit; a half hour later they were gone.

But these desert cloudbursts have their dangers too. At Elves Chasm we made camp on a smooth, sandy beach beside Arch Creek, an innocent appearing stream which came tumbling out of a rocky side canyon. We had picked our bedsites, unrolled sleeping bags, and were beginning to enjoy the peace and restfulness of camp routine after a hard day. Suddenly, with a roar like a streamliner, Arch Creek went over its banks. Within two minutes a raging, muddy torrent swept over the camp. By fast work everything was saved, but when the stream subsided a half hour later our sandy beach was gone, leaving bare, rocky ledges in its place.

Each day we scanned the cliffs for mountain sheep. Signs were plentiful and once we ran across a fine skull with huge, curving horns; but we never caught sight of these hooved rock-climbers.

In fact, animal life was surprisingly scarce. The sole living things we saw in the three weeks we were on the river were canyon wrens, a wild burro who brayed derisively at us from the shore, two harmless snakes, and a tarantula. Of rattlesnakes and scorpions we saw no trace, although we kept our eyes open in brushy and stony places.

Slowly but surely we ticked off the rapids: Granite Falls, Boucher, Deubendorff, Upset—all names which in the past have spelled disaster in Colorado River history. At 164-Mile Rapid, Zee Grant took his third spill, but arrived at the foot once again victoriously astride the capsized kayak. The river got three strikes on Zee but couldn't put him out!

At Diamond Creek, our last river camp, civilization was just around the corner. At noon August 1 we slid down Bridge Canyon Rapid into the quiet waters of Lake Mead. Three days later, as we tied up to the boat landing at Boulder City, a lady ran up to Norm.

"Oh, Mr. Nevills," she said, "was there any time when you were really frightened?"

"Only once," answered Norm.

"When was that?" she asked.

"From the time we shoved off until we reached Lake Mead."

Collecting Sierra Passes

By NORMAN B. LIVERMORE, JR.

CLIMBERS have their peaks, mules their grass, and piscatorians their wily trout. What, then, can ordinary Sierra travelers "collect" on their mountain trips? We may not care to climb, to fish, or even to eat grass, and yet we are no less Sierra enthusiasts than these specialists.

The answer, it seems to me, is that we should collect Sierra passes. This is the simplest and most tangible way to measure the completeness with which we have explored our nation's finest remaining wilderness. In estimating the extent to which we have been able to assimilate the joy and inspiration of Sierra scenery, I can think of no better measuring rod than the passes we have crossed. Sierra scenes can be analyzed into their major components of mountains, lakes, meadows, flowers, streams, forests, wild life, and clouds. These major components are so numerous as to defy measurement. But the Sierra has comparatively few passes, and it is in knowing these various passes and their tributary trails that we are able to enjoy to the maximum the inspirational Sierra scene.

At the risk of being criticized as an inept analyst of an intangible subject, and with the hope of provoking discussion among wilderness enthusiasts, I shall attempt to list, compare, and rate the major Sierra passes as they react on my own sensibilities.

In listing Sierra passes, I am including only the high country bounded by the Tioga Road on the north and the Kern region on the south. To me, this country presents the logical wilderness unit. I know there are many fine passes outside its boundaries, but I have been privileged to cross only a few of them, so I do not feel able to judge beyond this main area.

In the list given below, I have shown only those passes over 10,000 feet in elevation. This eliminates a few important low passes leading to the high country. But it is the higher passes that interest us most, and I think the 10,000-foot dividing line is logical. By starting at this altitude we obtain a list of an even fifty passes, which is a convenient number against which to measure our pass-crossing accomplishments.

I hope rock-climbing and knapsack enthusiasts will forgive me for omitting the countless fine passes which are easily accessible to them. But in using the word "Passcrossover," I am thinking of the ordinary Sierra traveler who is largely dependent on horse, burro, or mule transport. So I will only mention animal passes.

For the sake of convenience I have divided the passes into western, central, and eastern passes, starting north and working south.

WESTERN

Fernandez	10,175	Black Rock	11,500
Goodale	11,100	Sawtooth	11,500
Hell-for-Sure	11,300	Franklin	11,400
Elizabeth	11,300	Farewell Gap	10,588
Kaweah Gap	10,800	Coyote	10,000

CENTRAL

Tuolumne	10,300	Mather	12,010
Vogelsang	10,700	Cartridge	11,800
Isberg	10,500	Granite	10,677
Post Peak	10,800	Pinchot	12,050
Parker	11,100	Glen	11,900
Koip	12,300	Sphinx	10,010
Gem	10,700	Forester	13,100
Donohue	11,100	Junction	13,200
Island	10,250	Colby	12,100
Silver	10,700	Copper	12,330
Selden	10,872	Siberian	10,700
Muir	12,059	Shotgun	11,300

EASTERN

Mono (Bloody)	10,599	Sawmill	11,200
Duck	10,900	Baxter	12,000
Red Slate	12,000	Kearsarge	11,823
Mono	12,000	Shepherd	12,050
Pine Creek	11,200	Whitney	13,700
Piute	11,409	Army	12,000
Bishop	11,989	Cottonwood	11,200
Taboose	11,500	Mulkey	10,400

Having established our basic list of fifty passes, we find it interesting to try to analyze their peculiar charms and characteristics. Every pass has its appeal, but some are obviously outstanding in

certain qualities. I have listed in rated order ten passes in each of five different categories, but will comment in detail on only the first two or three of each group. And here's where the fun begins. I can already hear the warm arguments my ratings will provoke among many Sierrans who know their favorite passes better than I, and whose reactions to a given scene may differ radically from mine. But anyway, here goes!

High passes (over 12,000 ft.).—Height is the only definitely measurable feature of a pass. And even it is not too accurate. In placing Junction higher than Forester, for instance, I am going more on personal judgment from trail views than from the topographic maps. And as for 12,000-foot passes, just try to pick from topo sheets the difference in altitude between Red Slate, Mono, Baxter, and Army!

1. Whitney	13,700	6. Colby	12,100
2. Junction	13,200	7. Muir	12,059
3. Forester	13,100	8. Shepherd	12,050
4. Copper	12,330	9. Pinchot	12,050
5. Koip	12,300	10. Mather	12,010

Rough passes.—Rough passes furnish the packer with his most vivid memories, and mules their toughest chore. It's difficult in rating the rough passes to forget particular rough-trail stretches that are only part of a given pass trail. But taking the picture as a whole, I'll nominate Cartridge for the champion of this class, with Taboose a close second.

1. Cartridge	6. Koip
2. Taboose	7. Hell-for-Sure
3. Copper	8. Shepherd
4. Sawtooth	9. Glen
5. Baxter	10. Junction

Easy passes.—On the pleasant side, we have those gentle passes, usually the lowest ones, which present the least difficulty in crossing. These are the mules' delight, though for the passcrosser they may lack the beauty and excitement of some of the higher passes.

Much the easiest is Parker. The approach to its summit is so gentle that it is hard to tell when you are on top. In fact, the very top of the pass would be a good site for a baseball field! The second easiest pass is Mulkey. It leads into the south fork of the Kern,

which, it is hoped, will be included in an extension of the High Sierra Wilderness Area.

1. Parker	6. Siberian
2. Mulkey	7. Silver
3. Sphinx	8. Piute
4. Island	9. Farewell Gap
5. Gem	10. Coyote

Friendly passes.—The friendly passes are closely allied to the easy ones, but I like to think of them as having more variety and charm, less monotony, and yet not too much of the awesomeness we feel when crossing spectacular passes. In this category, my favorite is Silver, with Granite a close second.

1. Silver	6. Colby
2. Granite	7. Pine Creek
3. Kaweah Gap	8. Cottonwood
4. Piute	9. Parker
5. Selden	10. Coyote

Spectacular passes.—There are so many spectacular passes, that I find this the most difficult class of all in which to pick favorites. Personal impressions play a large part here, and it is chiefly for this reason that my first choice goes to little-known Copper Pass, at the head of the divide between Cloud and Deadman Canyons. Many years ago I first crossed this pass with six head of stock. We were traveling from east to west, and were not even sure there was a way through. I shall never forget the spectacular view and sheer drop off that presented itself when we reached the top.

A close second is Koip Pass, whose hair-raising edge-of-precipice switchbacks and Nevada desert view are superb.

Of the Muir Trail passes, I think Forester takes the palm for spectacularity when traveled from north to south. The switchbacks on the south side, and the superb view of the Upper Kern and the Kaweahs are sights that are vivid memories to all Muir Trail pack-trippers.

1. Copper	6. Whitney
2. Koip	7. Sawtooth
3. Forester	8. Army
4. Junction	9. Muir
5. Glen	10. Mono

Little-known passes.—This is subject matter for an essay in itself, but hasty mention of a few outside of our fifty "regular" passes may not be amiss. There are doubtless other little-known passes in the high country that are passable for stock, but these are outstanding.

Tunemah Pass (10,879) from Crown Creek into Simpson Meadow: This was last crossed, so far as I know, by a "forty burro Barrett" party. Its name is supposed to represent the American version of a cuss word forcibly uttered by a Chinese who thought the trail too rough.

Knapsack Pass (11,600) from Dusy Basin into north Palisade Creek: Used by burro parties, I am told.

Harrison Pass (12,600) on the Kings River divide: Crossed by a few burro parties in a south-north direction.

Gardiner Pass (11,300) from Charlotte Lake into Gardiner Basin: This pass, though rough, is regularly used by packers for "spot" parties from Independence.

Diaz Pass (13,000) north of Army Pass: Used in old days by sheepmen, and more recently by Whitney Morrow and his dog, of Whitney Portal anecdote fame.

Italy Pass (12,300) from Pine Creek Lakes to Lake Italy: This rough pass is occasionally used by local packers.

Sixty Lakes Pass (11,600) from Gardiner Basin to Sixty Lakes: This pass, probably the roughest of them all, was crossed last summer by the "Three Corner Round" burro outfit, run by the Cleveland Museum of Natural History, who inherited the outfit from "forty burro Barrett."

Longley Pass (12,600) from Reflection Lake to Cloud Canyon: This pass is shown on all topo sheets, and was reputedly used by early sheepmen. But I have yet to find a mountaineer who has crossed it with stock since the turn of the century.

The champion.—For the all-round champion pass, I'll choose Glen. It's high and spectacular. It's plenty rough, but also has easy spots. And in spite of its height and austerity, it is a friendly pass, with cordial little lakes nestled quite close to the summit on either side. It is the best pass I know from which to watch stock moving; I always thrill to the sight of pack trains winding up its steep switchbacks. And it is the only pass except Copper where the trail literally straddles a knife-edged ridge.

Rating yourself as a passcrossover.—If you are interested in measuring how well you have covered the Sierra wilderness, give yourself two points for every Sierra pass you have crossed *in both directions* and see how close you come to 100! It's fair to chalk up only one point for each direction in which you cross a pass, because to cross in one direction is to do the job but halfway. Take Forester, for instance: the south-north crossing is entirely different from the north-south.

On this scale, it would be interesting to find out how many Sierrans could score 50 per cent. I venture to say that no one alive today could score 70 per cent. And as for 100 per cent, it would take more packtrip days and routes than even the most ardent of us can manage, to cross all 50 passes in both directions.

But even if your passcrossing score is only 50 per cent, or 40, or 30, or 10, you can still thrill with the knowledge that here is a challenging frontier, comparatively unspoiled. Here are passes still to be crossed in a frontier manner, and here the virgin scene is unspoiled by the march of mechanized civilization. May it ever remain so.

Safety Last?

By MORGAN HARRIS

WHAT is more paradoxical than to speak of safety in connection with rock-climbing? If one insists on emulating a fly, security is impossible. Mountaineering by nature is dangerous; we should follow common sense and keep both feet on *terra firma*.

Such is the layman's perspective; and, of course, climbing is dangerous. But danger is not a unique element, even in everyday life; on the contrary it is a normal component in varying degree, of many ordinary peacetime activities, as the statistician's figures will attest.

Pedestrian accidents and occupational mishaps account for a heavy annual toll in life and limb; such risks as fire, burns, and carbon monoxide poisoning must be reckoned with, and the bathtub is notorious. True, these risks, a necessary evil not ordinarily to be avoided by choice, are in a different class from risks assumed in recreation, such as mountaineering—and Sunday driving. But the concept of danger is not objective; it depends less on what *could* happen than on a subjective estimate of what *might* take place. In Sunday driving long contact has reduced the element of risk in our own minds to that nebulous "reasonable" state.¹ But what would be the opinion of one of our ancestors, were he suddenly resurrected and placed beside a modern highway? Might he not very well conclude that driving was just a spectacular means of committing suicide?

The attitude of the modern nonclimber, who "didn't lose anything up there," is comparable to that of this ancestor. Mountaineering is a means of suicide; vertical mountain walls seem terrifying, their dangers vague and unpredictable. Control of these dangers appears impossible. This attitude is born of unfamiliarity, of confusing potential danger with such danger in climbing as is *actual*—the chance of accident facing an experienced party of mountaineers. What are the actual dangers? And what can—indeed, what should—experienced mountaineers do to minimize the danger?

Objective danger.—The hazards of climbing fall conveniently

¹The Annual Statistical Report for 1941 from the Department of Motor Vehicles of the State of California states that in traffic accidents 603,326 persons were killed or injured in California between the years of 1928-1941.

into two classes: objective and subjective danger. Under the first heading belong such potential sources of accident as the fall of precipitation, night, and avalanches whether of snow, ice, or rock—processes which are not introduced by the climbing party. They lead to accident only if a climber is present when they happen.

Objective dangers cannot be controlled; they can, nevertheless, usually be avoided. To avoid being caught by storm, the mountaineer becomes a meteorologist. Knowing weather signs, he knows when to stay off his mountain; but he also knows that weather signs can be deceiving, and he can make certain, beforehand, that he has enough food, clothing, and equipment either to permit travel through the storm, or to enable him to sit it out. With a strong focusing headlight added to these paraphernalia, he can be safe even when an error of judgment results in his benightedness on a climb. To avoid avalanches he does not advance upon a mountain on which these hazards are known to exist without first having acquired enough knowledge of rock structure and snowcraft to allow him to forecast where and when the avalanches will occur.² Knowing that his forecasts are subject to error, he will wherever possible restrict his climbing route to ridges, buttresses, and faces, keeping out of the couloirs and chutes in which avalanches occur. These dangers can be avoided only if the mountaineer has ample experience; for anticipation, which derives from experience, is his chief weapon of defense. Of course, if only experienced mountaineers were allowed to climb, the peaks would soon be vacant. The beginner, too, needs experience in avoiding objective dangers; since he cannot know in advance just what to anticipate until he acquires his experience, he should acquire it in small portions, from others where he can, rather than from the mountain alone. The beginning swimmer is told not to go *in* over his head. The beginning mountaineer's best defense for objective danger is to consider his head and not go too far *up* over it.

Subjective danger.—To put it simply, subjective danger in climbing is the risk of falling off the mountain. A careless slip, an error in calculating one's holds, a faint, or sudden illness—these and similar factors are subjective risks, which originate with the climber; the mountain merely provides the cliffs from which to fall.

²See sections on Equipment, Travel in Storm, Travel at Night, and Snowcraft and Avalanches, *Manual of Ski Mountaineering*, David R. Brower (ed.), University of California Press, 1942.

Serious results are not necessarily a consequence of every fall while climbing. The route of ascent may be of low average angle. A slip here might result in a few bumps and bruises, but the recipient of these indignities would come to rest within a few feet, for lack of enough momentum. Usually, of course, climbing takes place on steep cliffs where if a slip occurs neither the irregularities of the rock nor the falling man alone can prevent his sudden descent. Wherever a portion of a climb, or pitch, is so steep that an unchecked fall would have serious consequences, the pitch is *exposed*. Exposure bears no relation to the actual physical difficulties of climbing; a given pitch may be relatively easy to ascend, yet exposed.

The risk of falling in exposed places is an ever-present danger, perhaps the most important that confronts the mountaineer. One may avoid it, of course, by staying off those places. But mountaineers prefer not to stay off, for obscure reasons that need not be reviewed for anyone who has read this far. Moreover, the mountaineer can deal with this danger summarily.

THE MARGIN OF SAFETY

Granted that the risk of falling off is serious, what can be done about it? The self-evident "Be careful not to fall off" expresses one important practical means of safeguarding progress in climbing. An ounce of prevention here is well worth the pound of cure in equipment and technique for checking a fall. The trick is in knowing how careful to be.

A beginner at first has no way of predicting whether he can safely surmount a given cliff. His initial attempts must be safeguarded by a rope held firmly from above. With this safety device he, like a tumbler working over a sand pit with a safety belt, can practice climbing rocks. He learns to move smoothly up the cliff from hold to hold, in balance over his feet, rather than clawing desperately and hauling himself along, stomach-fashion, by main strength and awkwardness. He learns the techniques of holding himself in place by pressure: how to ascend a steep holdless crack by alternately jamming in arms and legs, or to climb a slightly wider chimney by back-and-knee. Above all, he learns to judge and anticipate the detailed moves from hold to hold, so that it becomes second nature to estimate difficulties ahead.

These are the bare essentials of rock-climbing technique,³ the *sine qua non* for traveling on a mountain of any marked difficulty. But a major ascent is not the proper occasion for learning these things. The beginner's companions often have little desire to stop and wait while he experiments with this or that approach to a pitch, or to be held back by his slow progress, lest the time consumed prevent completion of the climb. Moreover the high angles and precipitous drops below are apt to discourage a novice from learning by the trial and error method.

Small local practice cliffs, short enough for the rope to reach from top to bottom, form a much more suitable environment for beginners. There, under the protection of a rope and without the frightening effects of height, one may experiment with each new climbing technique, even to the point of falling. After many falls the climber gradually acquires a fairly definite idea of how far he can go without falling off; he builds up a mental standard of his own climbing. Standards vary between individuals according to native agility and experience, and to a lesser degree from day to day for each climber, depending on physical condition and mental outlook. On the basis of one's own standard, out of a background of practice, it is possible to lay down a subjective margin of safety, under which one may climb with reasonable assurance that a fall will not occur.

The essence of the use of a safety margin in climbing is in maintaining it rigidly; this is only possible if the climber knows how near he is to falling at any particular time. Extensive practice climbing, with many falls, is the best source of information. The value of local practice in climbing has been emphasized only recently.⁴ In the past the prevailing view has been that long easy routes on actual mountains, later more difficult climbs, were best for the development of mountaineering judgment. A fall at any time was naturally discouraged as bad form. But no amount of easy or difficult climbing without a fall will allow one to set up a reliable margin of safety; without having fallen on difficult rocks, the climber never knows exactly how near or far he may have been from a fall.

³Part of the details of rock-climbing technique has been excellently presented in articles by Robert L. M. Underhill, "The Technique of Rock-climbing," *Appalachia*, Dec. 1933, XVII:4, p. 565, and Dec. 1939, XXII:4, p. 486, as well as in the classic *Mountain Craft*, Geoffrey Winthrop Young (ed.), London, 1920.

⁴"Values to be Derived from Local Rock-Climbing," by Richard M. Leonard, *Sierra Club Bulletin*, 19:3, p. 28, 1934.

Once a climber has established his personal climbing standard, it is relatively simple to climb as second or third man in a party on an ascent of some length. The fear of height disappears gradually with increasing experience. Then comes the critical test of the reliability of one's safety margin—leading a climb. Now, no upper belay is present to correct errors. A good leader must have conservative judgment, experience, and confidence, and must avoid making mistakes.

How dependable is a margin of safety in guaranteeing climbing security? Given proper training, one may apply it with considerable confidence. It is like walking across a busy street: danger is all about but through experience a safe course may be chosen. A safety margin reduces accidents at their source. It is a mistake, however, to regard the margin of safety as the only reliable measure of security, for it cannot be perfect, simply because of human fallibility. Although no other sport so trains the mind for continual attention and critical judgment, still a climber isn't a machine. The leader cannot expect always to judge correctly each pitch of every climb. Instead he must allow for mistakes, particularly—and oddly—on easy rocks, especially toward the end of a long climbing day. In such circumstances climbers may be caught off guard, and accessory precautions should be redoubled rather than relaxed.

If climbing is not to involve excessive risk, purely subjective measures must be supported by other means of security. The rope, time-honored in its use, and a modern addition, the piton, are efforts in this direction.

SECURITY AND THE ROPE

Ordinarily the rope functions for safety only, not as a direct aid in climbing. It may serve as a psychological help but not as a physical means for ascending a difficult pitch. This is a sporting convention which places the members of a climbing party on a par. One's ego rebels at using the aid of the rope in surmounting a hard pitch which the leader ascended without aid; rope makes a poor crutch.

Protection as furnished by the rope depends on the use of the *belay*—running the rope around some fixed point which serves as a support in opposing the force of a fall. In practice the belayer, anchored to the rock, runs the climber's rope around his body, pay-

ing out or taking in slack as climbing progresses, ready at all times to absorb the shock of a fall. On easy rocks where the exposure is not great, actual belays may be dispensed with, the whole party moving continuously, though ready to swing into belay position if one of the climbers falls. Consecutive climbing is the rule on more difficult rocks, one climber moving while the others remain anchored and safeguard his progress by a belay. Belaying from above is easy, the rope being kept almost taut so that any fall would be short. A rigid anchor and considerable skill are required for belaying a leader from below, because of the long fall and heavy shock to the belayer which would follow a slip.*

Belaying skill is of no avail if the rope snaps from the strain of a fall. Accordingly the rope must have enough tensile strength and elasticity. Ordinary half-inch manila rope of three or four strands is satisfactory when new. The effective strength of a rope deteriorates with age and use. Underhill has pointed out that a new climbing rope loses over half its strength after a year of normal use. None but fresh unfrayed ropes should be used for serious climbing.

A belay is no better than the belayer. For belaying a leader, one should be able to absorb severe impacts. Body weight and a stocky build seem more important than mere muscular strength. Women and climbers of light weight are in general poor belayers. Belaying ability depends partly on climbing experience but to a greater extent on local practice in selecting proper belaying positions, as well as suitable anchors to the rock; particularly it depends upon actually stopping test falls. Obviously practice must be conducted on short cliffs without exposure, to avoid injury should the belayer be unable to check a fall.

The development of belaying methods in the past has been amazingly slow, possibly because climbers were more interested in climbing mountains than in experimenting on local cliffs. Few analysts have sought to improve methods. Yet an attitude of constructive search for new ideas is necessary if rock-climbing is to be made a progressively safer sport. The belay has gone through several stages of development. In its crudest form, the *direct belay*, as advocated by Abraham,* the rope from the climber is placed firmly over a spike

*This sketchy outline of belaying technique is given only as a background for the present discussion. Detailed description of methods will be found in an article by Underhill, "The Use and Management of the Rope in Rock Work," *Sierra Club Bulletin*, 16:1, p. 67, 1931.

*George Abraham, *Modern Mountaineering*, 1933, London, p. 153.

of rock. Should the leader fall, he is subjected to a merciless jerk as the slack disappears. If the rope does not snap, the ribs of the climber certainly ought to. The *indirect belay* of Young¹ is an improvement: the second man, anchored firmly, either interposes some part of his body around the rope between its point of attachment and the leader, or plays the rope around his hips or shoulders. Although the belayer attempts to hold the rope firmly, the force of the fall will be exerted on his body, which can act as a spring to cushion the shock.

Recently a new technique of belaying has been developed² which represents an outstanding advance and deserves to be more widely publicized. This method might be termed a *dynamic belay*: as in the ordinary indirect belay, the belayer, anchored firmly and securely placed, runs the climbing rope around his body, preferably about the hips. But when a fall takes place, instead of holding the rope firmly as the shock occurs, the belayer first allows the rope to slide around him. The falling climber is then brought to a stop by progressively increasing the friction of the rope as it moves around the belayer's body. Rather than trying to stop the fall immediately, he overcomes the momentum gradually by a braking action, with great decrease in the shock which would otherwise result. The amount of rope let out depends on the severity of the fall. Practice is essential in learning the "feel" of the sliding rope, as well as in regulating the amount of friction exerted on the rope as it passes through the hands and around the body.

There is a definite danger that climbers may overlook the value of local belaying practice and rely on belaying techniques which have not been put to adequate test. To depend on a faulty belay is worse than having none at all. No one who has once tried to hold even a five-foot practice fall will try to use, when such a fall is likely to occur on a climb, anything but a hip belay, preferably in a sitting position. Shoulder and knee belays are feeble enough even when the belayer is above and the rope is taut. A belay around a rock is too often unadaptable.

Several recent accidents might well have been prevented by training which gave contact with the actual stresses and strains of falls. Holding a five- or ten-foot test fall is a graphic object lesson in

¹*Mountain Craft, op. cit.*

²Richard M. Leonard, *Appalachia*, Dec. 1934, XX:9, p. 179.

reality. And only constant practice will prepare the reflexes against the emergency which, in actual climbing, may put one's belaying skill to a crucial test.

Given proper experience and the best techniques available, what are the chances of stopping a fall by belaying methods? Data from local practice⁶ show that belays from above, with no appreciable slack, are fully efficient in checking falls; the second or third man may climb with complete confidence in the rope for protection. By means of jumps from an overhanging cliff, with a known amount of slack in the rope, leaders' falls have been simulated. Such tests demonstrate that the second man must be anchored in a "bomb-proof" position, with center of gravity low. Body belays usually give way from a fall of ten feet or less. With piton belays, falls up to 18 feet have been held. Danger to the falling person, as well as to the belayer, have prevented experimentation with longer drops. At present a technique is badly needed which will give some insight into the belaying of high falls. Local tests are currently in progress to determine by quantitative methods the effective forces developed in falling. Perhaps through the use of dead, instead of live weights, the stresses of long falls may thus be measured.

Viewed from the rocking chair, the reliability of a belay in checking a leader's fall is not perfect. Even in short practice falls the shock is heavy. What would the shock be like in an accidental fall, perhaps when a leader has sixty feet of rope out, when a fall isn't fully expected, and when the belayer has no chance to perfect his stance through preliminary trials? To cope this potential shock and surprise, the belayer must and can cultivate vigilance as a habit; his practice falls allow him to predict where and how the stresses and strains would appear. If the leader had taken out sixty feet of rope, his fall would almost certainly be somewhat broken by friction and collision with the cliff during descent, so that the force of a high fall might be less than in a test jump over an overhang. In high-angle climbing, belay positions would usually be closer together than sixty feet, anyway. Consequently, chances of stopping a fall can be quite favorable. But, belays alone are not a panacea for the risk of climbing. They are seriously deficient when a leader falls on steep rock.

⁶Tests by the Rock-Climbing Section, San Francisco Bay Chapter of the Sierra Club, discussed by Richard M. Leonard in *Appalachia*, Dec. 1934, p. 178.

THE ROLE OF PITONS

Pitons are the greatest contribution to mountaineering safety since the introduction of the rope. An ordinary piton is a thin, flattened iron spike which may be driven firmly into cracks in the rock, and which possesses an eye to which the rope can be secured through a snap link, or carabiner. On exposed pitches where the chance of falling is appreciable because of difficulty of the climbing, pitons are placed at intervals for security. The effect of these intermediate points of attachment for the rope is to prevent a fall of more than a few feet at any time, which can easily be held through the pitons by a belayer below. Thus the biggest bogey of climbing—the danger of serious injury when a leader falls on difficult rock—can largely be circumvented.

In addition to functioning purely for security, pitons are also useful in overcoming occasional holdless pitches which would otherwise bar ascent. Ordinarily, direct aid by pitons is a last resort when all else fails. In some climbing circles the use of pitons, either for direct aid or for security, is frowned on as "unsporting." Whether unsporting or not, piton technique makes climbing immeasurably safer, and deserves to be retained on this basis alone.

With the advent of pitons come new technical problems in rock-climbing. The factor of experience here is no less important than in the handling of the rope. One must learn to pick out suitable piton cracks, to drive in pitons while clinging to scanty holds, to recognize the peculiar musical ring of a sound piton as it goes into the rock. After being placed, a piton must be tested by severe jerking with the rope and judicious pounding to and fro. The plane of the crack in which the piton lies is important and should if possible be perpendicular to the line of fall. Belaying technique must be modified to deal with a force directed up instead of down. A strong anchor from directly beneath the belayer is essential, with the rope passing around the buttocks rather than the hips.

As in other climbing techniques, initiation should take place on a short unexposed practice cliff, where beginners can safely experiment with driving and using of pitons. Tests by actual fall can be made to verify estimates of a given piton—whether it is securely placed or will give way under a heavy shock. Practice in belaying through pitons is equally important. The physical stresses are quite different from an ordinary body belay, and a new stance must be

learned. As in the conventional belay, the shock of a fall should not be taken up too abruptly, the rope instead being allowed to slide. It may even be necessary for the belayer to start the rope sliding around his body to eliminate the static friction. Rigidity in the belay may result in the rope breaking at the carabiner, if the fall is high. No leader on a difficult climb should have to rely on a second man whose ability for belaying through pitons is untested in practice.

If, on difficult rock, sound pitons can be placed at intervals of five or ten feet, and if the belayer is capable and alert, the probability of stopping any falls is very high. Such falls have been held often. This conclusion is supported not only in practice, but also during several climbs where they were accidental.¹⁹

As the vertical distance between leader and piton increases, the protective value of the piton naturally declines. The upper limits of reliability for pitons are not yet known and should be the subject of tests. It is reasonable to expect that even falls of 50 feet or more can be checked by proper technique, but until this is demonstrated in practice, the value of pitons for high falls must remain an open question. Actually, if the rock is difficult enough to require piton work, suitable cracks can usually be found at successive intervals of a few feet, and a severe fall need not occur.

It is unwarranted, however, to place confidence in pitons without at the same time realizing certain pitfalls in their use. A piton should be malleable enough not to snap under strain, brittle types of metal should be avoided, and each piton should be carefully inspected for flaws.

Pitons should be freshly placed, even if previous climbing parties have left theirs behind in the rock. Weathering weakens the position of a piton in a crack; moreover, there is no way of knowing how reliable the pitons were originally. Failure to observe this precaution has led to serious accidents.

Wherever possible, pitons should be removed by the last member of a party. Besides eliminating a hazard for future climbers, this practice has the added advantage of leaving the rock in nearly its original condition. Thus each succeeding party will be faced with the same physical difficulties found on the first ascent. In addition, the relative difficulty of removing a given piton offers an illuminating check on the leader's previous estimate of its reliability.

¹⁹Unpublished but recorded cases, Rock-climbing Section, San Francisco Bay Chapter of the Sierra Club.

Combined Tactics.—Emphasis should not be placed on any one method of providing security in climbing. The safety margin, ropes, and pitons are complementary and work toward a common goal of increased security. Their proper use in combination is an exercise in logic and common sense. Theoretically, the maximum safety would be gained by placing pitons everywhere along the climbing route and using the rope at all times. Practically the time consumed would render rock-climbing most unentertaining. As Underhill has pointed out, a balance must be struck in climbing between security and progress. The problem is to maintain this balance.

The old adage about putting all the eggs in one basket is particularly appropriate for climbing. Two or more safety techniques, one backing up the other, should always be in use. For example, if a climber misjudges his safety margin and falls, belays and the rope are still left as a second line of defense against accident. Similarly, if his belay, unknown to him, is poor, he will avoid disaster by maintaining his safety margin. The degree of protection afforded by either method is greatly enhanced by their joint use, for the mathematical probability of occurrence of an event depending on two simultaneous happenings, such as failure of safety margin and belay, is the product of the individual probabilities of the two.

WHEN DO WE ROPE?

In an actual ascent the particular means chosen for security are determined by the exposure and degree of difficulty of the climbing. On easy, unexposed stretches of rock a rope is unnecessary; a satisfactory margin of safety against falling can easily be maintained, and even if a fall occurred it would stop from lack of momentum. One can subdivide climbing of this character into two groups according to relative difficulty. *Class one*, in the scale of climbing difficulty used in "A Climber's Guide to the High Sierra," describes the easiest sort of climbing, only a step removed from walking, in which shoes of any type are satisfactory. At a slightly higher level of difficulty (*class two*), scrambling over rocks or snow necessitates the use of handholds and appropriate footgear in order to preserve one's footing. Hobnailed boots will be required for snow, hobnails or rubber-soled climbing shoes, preferably the latter, for rock.

There are many climbs which are moderate so long as weather is

ideal, the climber climbs efficiently, and the proper route is followed. But the climbs may be of such duration that a storm has ample time to arise, the party has ample time to become fatigued, or the route may be so complicated that it is easily lost. If the climb is of such a nature that the difficulty would be dangerously increased in such circumstances, it falls into *class three*. The rope will probably not be needed ordinarily, but would be required for safety by storm, fatigue, or loss of route. This is the least objective of the classifications; it is the one which says "you can probably walk up with your hands in your pockets, but you'd better take along a rope just in case."

As the angle of the rock increases to the point where a fall would in all probability not stop of its own accord without serious injury—that is, where exposure begins—the rope must be brought into play to supplement the margin of safety. Exposure may be present but the physical difficulties slight over long stretches of climbing. Belaying need then be potential only, all members of the party moving continuously, though roped together. With further steepening of the rock, potential belay points are fewer and farther apart, and the acceleration in a fall would be greater, so that there is danger of one man falling and dislodging the entire party, if all move at once. Hence belays are given at favorable points and the party progresses from one belay position to the next, moving one at a time. This is one of the commonest situations in rock-climbing—a series of pitches, each possessing a satisfactory sequence of holds but with definite exposure below. A carefully estimated margin of safety, supported by a good belay, is the defense against accident to the leader as well as second or third man. If the nature of the rock calls for extensive use of the rope, either in continuous or belayed climbing, the grade of difficulty is *class four*.

Whenever the protective value of the safety margin or rope is decreased materially, a third factor, the piton, is added. The leader may have a long exposed pitch above his belay, so that the reliability of the belay in case of a fall is seriously impaired. The use of pitons for safety is then indicated, to reduce the effective distance between belay and leader. Or the severity of the pitch may be so great that a margin of safety cannot be maintained and there is considerable danger of falling off from sheer lack of enough holds to hang on to. Here, similarly, the use of pitons to reinforce protection by belays

is essential. The use of pitons for safety indicates difficulty of *class five*.

Finally, holds may be absent and the leader partly or wholly suspended from a piton. All pitches in which pitons must be placed for direct aid fall into *class six*. A second piton for safety, and use of double rope if the exposure is very severe, add an additional measure of security to belays. Rock-climbers seem to enjoy propounding definitions for a seventh class. Perhaps they will accept this: pitons are necessary for direct aid, but cannot be placed.

CONCLUSION

If the analysis of safety in climbing seems abstract, perhaps it can be brought down to earth through a comparison with automobile driving, to show how the theory of safe climbing harmonizes with everyday standards of safety. The similarity between these two activities is remarkable, both with respect to the types of danger and the means for dealing with them.

Driving, like climbing, is continually surrounded by possibilities for accident, so that constant care is necessary to avoid them. Slight relaxation in vigilance at a critical moment may cause the car to go off the road or lead to a head-on collision with another vehicle. These dangers are recognized and accepted by the driver. In either climbing or driving, the actual risk of injury at any particular time depends on two factors, the relative chance of an accident occurring and the probable results if an accident takes place. Whether or not an accident occurs hinges largely on the decisions and actions of the driver or leader; the dangers are subjective. The consequences of accident in terms of injury can be estimated on the basis of a factor unnamed in driving but called "exposure" in climbing. In either activity this factor is essentially the momentum attained before accident and the manner in which this momentum is suddenly checked. We might logically speak of "serious exposure" in modern high speed driving, if the result of a crash might well be fatal.

The safety measures are similar, whether taken to overcome the risk of a fall or crash. Good driving is based on the unvarying observance of a margin of safety. It is the distinguishing characteristic of a steady driver as opposed to one who is erratic. Yet a satisfactory safety margin is not enough, or safety interiors would be superfluous. The turret top, like the rope, is essentially a corrective fea-

ture; it backs up the margin of safety and gives the necessary double assurance to driving.

One might reasonably say that the actual frequency of mountaineering accidents, as reported in newspapers and other publications, is much higher than the present discussion would indicate. While no official statistics are available, the incidence is undeniably high, particularly in the Alps during the last decade or so. Inexperience accounts for a large number of accidents. Beginners ought never to attempt difficult ascents except under the guidance of more seasoned climbers. The pages of the *Alpine Journal* in recent years record the frequency with which this rule has been transgressed, with tragic results to inadequately trained parties. A difficult ascent, particularly when viewed from directly below, may appear deceptively easy. The novice may embark on a dangerous ascent with no true idea of the peril confronting him.

The most thorough training and experience are useless in preventing accidents unless one's psychological approach to mountaineering is conservative. American climbers in general look on mountaineering as a recreation, in which serious risk of injury is not justifiable, but their climbing philosophy does not hold with that of a spokesman of the "Munich school" of climbers, who said, "In the game of mountaineering it is occasionally worth while to risk one's life consciously, deliberately and meritoriously." This fanatic zeal for climbing, regardless of risk, has been thought a product of postwar disillusionment among younger men; perhaps competition between climbing parties, fanned by intense nationalistic feeling, has nourished the zeal. Whatever the cause, reckless disregard for danger has done much to give mountaineering a bad name.

This do-or-die spirit in mountaineering cannot be condemned too strongly. It is a malignant growth which destroys the sport in climbing. But we should not be content with mere sanity in climbing, with the knowledge that our own mild philosophy of mountaineering should minimize accidents. The fact that any accidents occur at all ought to be a challenge to all mountaineer-analysts. Let them amass data on the reliability of the rope and piton in high falls; let them improve the old techniques and develop the new. Here is an enviable reputation for us to seek: not the most daring mountaineers in the world, but the safest.

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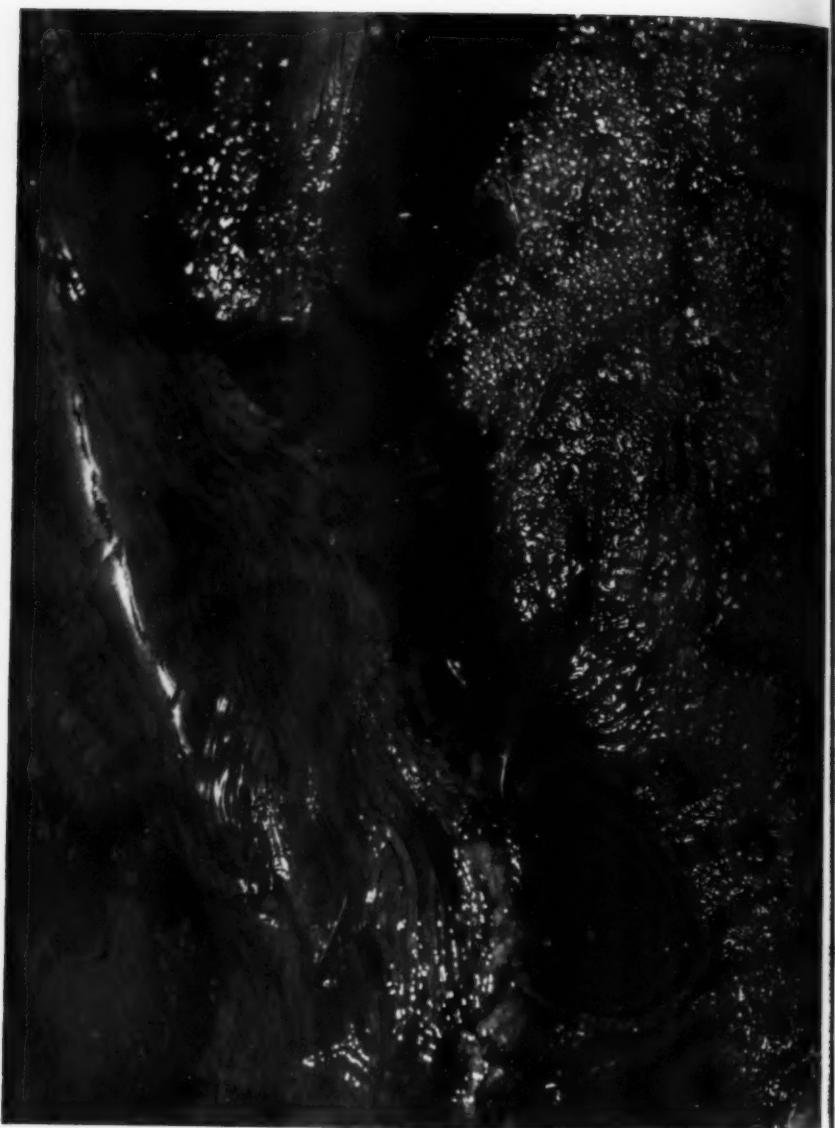


TILDEN LAKE By Cedric Wright





MULE DEER FAWN IN NORTHERN YOSEMITE By Cedric Wright

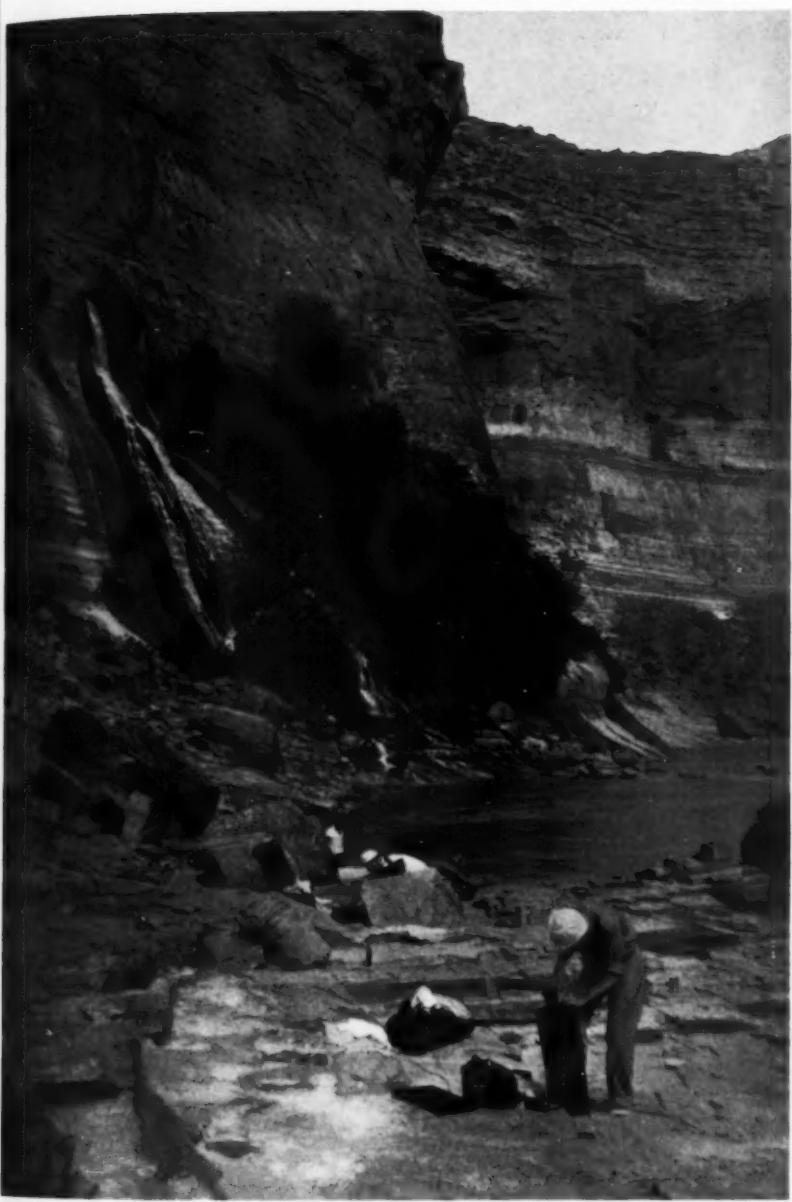


GRAND CANYON OF THE TUOLUMNE FROM RANCHERIA MOUNTAIN By Cedric Wright

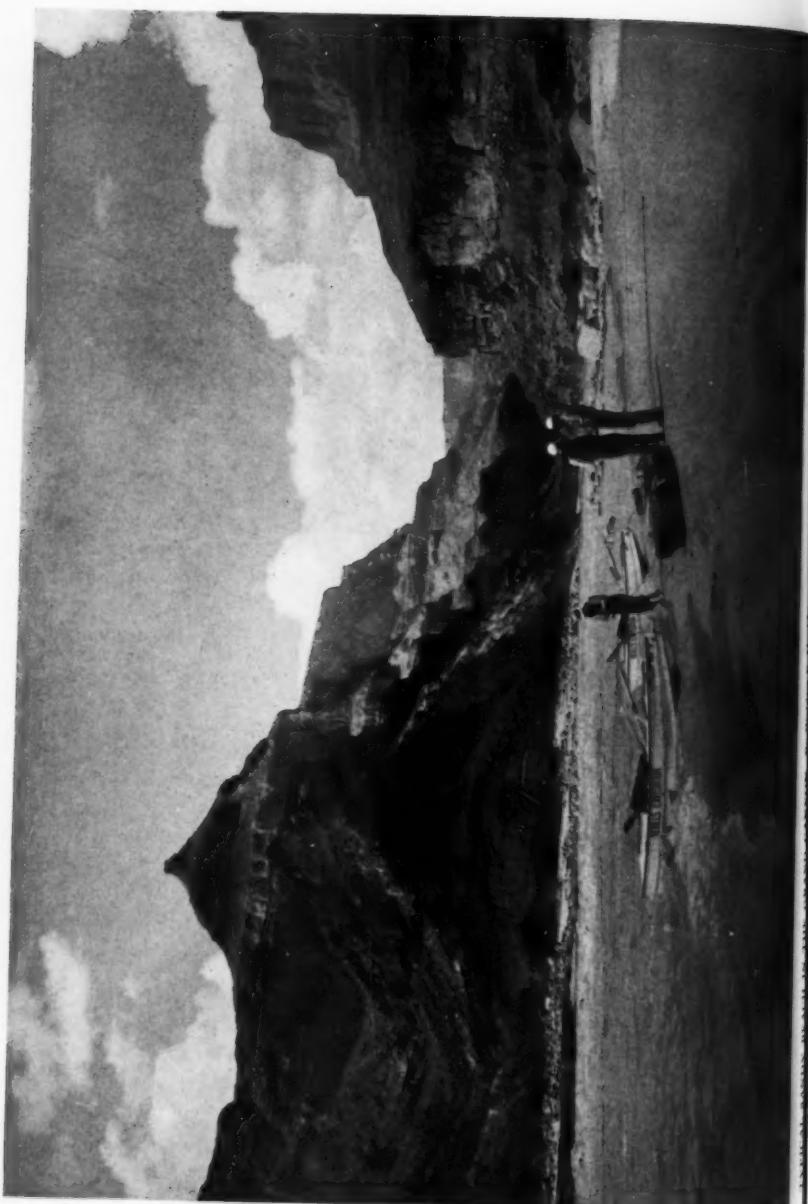




CAMP



CAMP IN MARBLE CANYON By Weldon F. Heald





RUNNING THE HORN CREEK RAPID By Weldon F. Heald

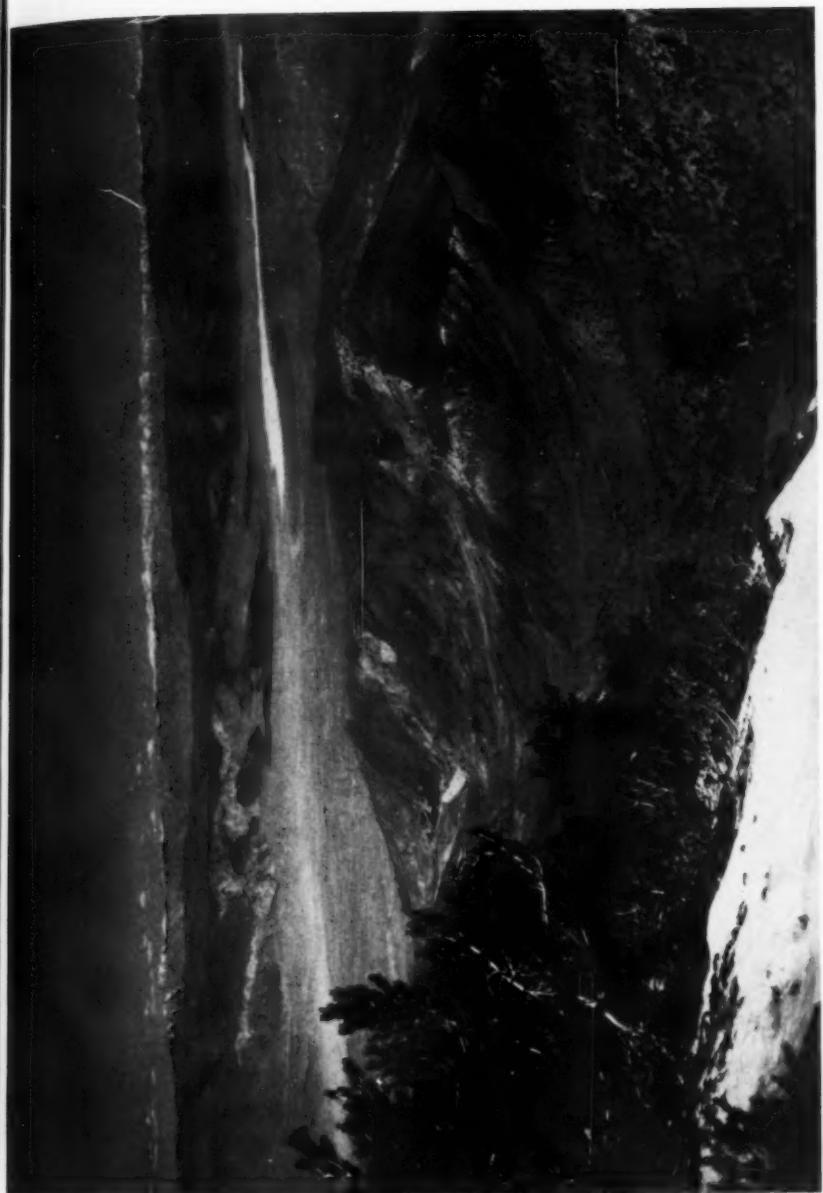


THE KA



THE KAYAK SHOOTING GRANITE FALLS By Weldon F. Heald





THE SOUTHERN SIERRA NEVADA FROM TELESCOPE PEAK By Weldon F. Heald





NORTH ALONG THE RIDGE TO CHARLESTON PEAK By Weldon F. Head



Up Under the Equator

BY JOHN THOMAS HOWELL

IT was not until years after I had stood on the highest point of Indefatigable Island in the Galápagos Archipelago that a fellow Sierran exclaimed, "Why, you made a first ascent!" Yes, I had to admit, I was party to a first ascent and a notable one; but, as my mind went back to that day in 1932, I was hesitant to accept the honor of a first ascent, that distinction so sought after by mountaineers. For, as botanist on the Templeton Crocker Expedition of the California Academy of Sciences, had I not leisurely and with a minimum of physical effort literally botanized my way to the 2,300-foot summit of Indefatigable Island along a route opened for Crocker and the rest of his party? Moreover, during the course of the expedition we never spoke of *ascending* the volcano in the center of Indefatigable, always we *penetrated* Indefatigable. The problem was not one of delicate mountaineering technique, and certainly, at so low an elevation less than a degree below the Equator, it wasn't a question of skill on ice or snow; it was a matter of perseverance and endurance in traversing the thorny scrub of desert lowlands, in climbing through tangled jungles of upland rain forests, and in crossing the rough and uncertain terrain on the side of a great volcano.

It was a problem of penetration. Others had attempted it and had failed: the early explorers, the California Academy of Sciences Expedition in 1905-06, William Beebe in 1923, and Vincent Astor in 1930. The terrain, the cactus thickets, the rain forest, or the upland brush, singly or combined, presented obstacles that had been unsurmountable. Until Indefatigable was penetrated in 1932, little had been known of the middle of the island; maps showed a mammoth volcano which rose gradually and symmetrically on all sides from the nearly circular shoreline of the island. Rumor had it that in the crater was a lake that discharged great floods of water upon the desert lowlands in times of exceptionally heavy rainfall. Actual conditions were found to be quite different. After ten years, as I look back on the Templeton Crocker Expedition, I regard the penetration of Indefatigable Island—the ascent of Mount Crocker—the most important single accomplishment of the expedition.

On May 1, 1932, after sailing for two weeks among the southern

islands in the Galápagos Archipelago, the *Zaca* anchored in the picturesque harbor of Academy Bay on the south side of Indefatigable Island. To the southwest, bold lava escarpments rose about fifty feet from the tropic-blue water of the bay or from dense thickets of dark green mangroves, and the mesalike skyline was crowned by a most extraordinary cactus forest with trees twenty to thirty feet tall. To the east, giant swells that rolled northward under the constant pressure of the southeast trade winds broke in a magnificent and booming surf on steep white beaches and jagged fingers of black lava. The innermost reaches of the bay extended to the west and north, where there was a small group of buildings belonging to Ecuadorian and Scandinavian fishermen; and beyond and above all rose the great central mountain of the island.

Immediately after our arrival, Crocker formulated plans for the trip to the top of the island, and he engaged an Icelander named Finsen to prospect a route through the forests and upland brush. One great advantage that we had was a trail about three and a half miles long which traversed the very rough terrain and thorn thickets of the lowlands and extended from Academy Bay inland to a plantation known as Fortuna, in the wet zone of the island. And beyond Fortuna we were again in luck. A stream course, which rose high up on the island and which was usually impossible to follow because of junglelike tangles that choked it, had been swept clear of obstacles by phenomenally high water earlier in the season; it lay an open route through the dense masses of underbrush of the forest belt. Beyond the head of the stream a trail had to be opened across a broad zone of shrubs which was dominated by a single kind belonging to the tropical genus *Miconia*. Because of the important bits of good fortune, it was just a week after our arrival at Academy Bay that Finsen reported to Crocker that he had prospected a route that would lead to the unknown heart of Indefatigable.

The next day we were up and off. Students of plant geography have remarked on the suddenness and completeness with which plant formations change in that borderland between the wet and dry tropics, and in our journey to the top of Indefatigable Island, this was strikingly exemplified. In a climb of about 2300 feet, in a distance of about ten miles, we passed through four belts of vegetation types as definite and as different as the life zones with which we are acquainted in our California mountains. Even at the head

of Academy Bay, the extreme type of cactus desert, which was characteristic of the harbor headlands, began to show features of vegetation transitional to the rain-forest jungle in the increase of mosses, ferns, vines, and undergrowth, although the fabulous cactus trees of *Cereus* and *Opuntia* still dominated the scene with their fantastic forms. The country was rough, with rocky parapets and great tumbled lava blocks, and we gained some idea of its treacherous character by a trailside crevasse in the lava that was so deep that a rock fell silently for three or four seconds. As we went along, moisture-loving vegetation replaced that of the desert. At an elevation as low as 350 feet we were in a tropical rain forest. Large trees were clothed with ferns and mosses, festooned with vines and large woody creepers, dense thickets of ferns and shrubs flourished in deep rich soil under the trees. Somewhat higher in a forest clearing, was the plantation, Fortuna. Here, we passed the night.

The following morning, May 9, we were up at daybreak and off for the top of the island. We followed the dry rocky bed of the providential stream through the midst of the jungle, and along its course we saw great piles of water-washed brush. Not long before, a great torrent must have swept down the mountain. Progress was not difficult, along gravel beds or from stone to stone, or now and again over low cataracts and falls, at only one of which a rope was used. Gradually the trees became lower and more scattered, and at about 900 feet a few individuals of the shrub *Miconia* appeared. Three hundred feet higher the *Miconia* was the only woody shrub and, together with giant brakes and low tree ferns, it covered all slopes and ridges with a dense, uniform, monotonous thicket about seven to ten feet tall. As we went along, the loose detritus which had covered the streambed farther down gave way to solid rock where pools of clear fresh water collected in hollows connected by tiny trickles; small rock gardens of flowers and ferns grew in moist crevices. Gradually the streambed became more confined; shortly we left it to use a trail Finsen had cut through the *Miconia*.

Then the vegetative scene changed again. Above 1500 feet, the *Miconia* gradually became less frequent and shorter, and above 1700 feet, where it was reduced to a height of only three feet, it was entirely replaced by several kinds of ferns which were about three feet tall and which became the dominant vegetative form. In low wet places where water seeped, sedges were common, and on steep

wet slopes *Sphagnum* formed broad mossy patches of bright yellow-green and a peculiar fluffy lichen (*Dictyonema*) produced queer mounds of grayish white. The long slender stems of three kinds of club moss (*Lycopodium*) crept along the ground under the ferns or clambered upward through the fronds. This general type of vegetation, different from anything I had ever seen before, covered everything and continued to the summit of the island.

The morning had been cloudy with intermittent showers, and in the early afternoon, when we reached the uppermost part of the island, a mantle of drifting fog concealed the highest ridges. By middle afternoon, however, when the mists rose and broke and the sun shone for a short time, we discovered we were on the floor of what was once an immense crater. The original crater rim was broken by recent volcanic activity and it was much wasted by weathering. The highest of the rim fragments, which was situated at the northeastern end of the crater, was about 300 feet above the mounds and flats of the crater floor and was the highest point of the island. Indefatigable had finally been penetrated and we began the ascent to the actual summit.

As we climbed the rim splinter that now bears the name Mount Crocker, the ever-widening panorama was stimulating and the general topography of the center of the island gradually became apparent. Beyond the confines of what was once the crater were numerous other cones and craters. The smaller ones near by were obviously more recent and parasitic upon the old cone, but some to the west were apparently independent, and these, together with the crater we were ascending, seemed to form a transverse east-west axis across the central highest part of the island. Far beyond stretches of indigo sea other islands became visible, and practically the entire coastline of Indefatigable Island, with all its coves and promontories, could be seen. While the grotesque cactus groves of the desert lowlands could scarcely be distinguished, the rain forests below the *Miconia* belt were clearly visible, and the remarkable fern formation crowning the island was everywhere about us. Surely here, where no one had ever been before, was a botanist's paradise. So alluring were the plants I could scarcely keep up with the rest of the party. But eventually, with plant press in one hand and specimens in the other, I arrived on top, and, in traditional manner, added my name to the record of a first ascent.

Telescope and Charleston Peaks

BY WELDON F. HEALD

BETWEEN the Sierra and the Rockies are high mountain ranges strangely neglected by climbers. Owing, probably, to the torrid stretches of desert surrounding them they are studiously avoided during the climbing season. And yet, as islands of true alpine climate in sharp contrast to the parched lands below, the "Basin Ranges" are among our most fascinating mountains. Also, in early summer, the deserts are not uncomfortably hot, while the higher peaks offer some rather sporting snow climbs.

Last June a companion and I sampled two of these high desert mountains—Telescope and Charleston peaks. The satisfaction in standing upon these grand summits, as if suspended in observation balloons 11,000 feet above the desert, was out of all proportion to the achievement.

By way of Lone Pine it is an easy day's journey from Los Angeles to the first night's camp at Mahogany Flats, not far from Telescope Peak. Appreciable time may be saved by taking the right-hand road just beyond the dry lake on the floor of Panamint Valley. This eleven-mile cut-off joins the Trona—Death Valley road at the foot of Wildrose Canyon. It is a bumpy, dusty track across the desert, but it saves going over Towne's Pass and up Emigrant Canyon—a good thirty miles.

A steep dirt road through upper Wildrose Canyon leads to Mahogany Flats, perched on the divide of the Panamint Range, 8133 feet above sea level. At the Flats there is an unimproved camp-ground among the piñons and junipers with stupendous views into Death Valley to the east and across to the long line of the Sierra on the western horizon. A well-graded foot trail leads six miles to the top of Telescope Peak.

The wind-swept upper slopes of the Panamints form an interesting botanical island in the midst of the desert. Grassy uplands covered with alpine flowers alternate with groves of limber pines (*Pinus flexilis*), while Telescope Peak itself has an open forest of giant foxtail pines (*P. balfouriana*), an outpost for this mountain tree a hundred miles from its native Sierra.*

*Sudworth describes these trees as bristlecone pines (*P. aristata*), but I believe he never visited Telescope Peak.

On June 11 we found the final cone still buried in snow. The trail switchbacked up the steep east face under thirty-foot drifts, so we were forced to attack the north ridge. Near the top the ice-ax was useful, but not absolutely necessary. Later, on the descent, when the snow had softened somewhat, the upper thousand feet of the ridge gave us a series of exhilarating glissades.

The view from the summit of Telescope Peak, 11,045 feet, is utterly magnificent. In 1860 W. T. Henderson, the first white man to ascend it, christened the peak—and aptly. Only through a telescope had he seen so far. To the east, Death Valley shimmers in the heat haze 11,300 feet below, and colorful desert ranges, row upon row, lie baking in the sun. To the west, a hundred miles of snowy Sierra peaks rim the sky with the huge bulk of White Mountain sprawled across their northern flanks. Dim on the southern horizon are the blue ranges of San Gabriel and San Bernardino rising above the Mojave Desert. To the east, in Nevada, Spring Mountain Range sweeps in long ridges to white-tipped Charleston Peak. Nowhere in the thousands of square miles spread out before one is there a town, field or human habitation visible to the naked eye.

After two nights at Mahogany Flats we broke camp and headed for Charleston Peak. The route crosses Death Valley, climbs over Daylight Pass into Nevada, thence through Beatty and Indian Springs to Charleston Park at the head of Kyle Canyon. There we camped late that afternoon, at 7500 feet among the pines, firs, and aspens. Above us rose a horseshoe of 4000-foot limestone cliffs worthy of the Sierra itself. From the end of the Kyle Canyon road a trail winds up the precipitous walls to the ridge which it follows to the summit of Charleston Peak—a pull of 4400 feet in eight miles.

We saw immediately that the trail would be of no use to us. The cliffs, ridges, and peaks were loaded with tremendous masses of snow. The ranger told us no one had attempted the climb so far that season. He advised against it; so did the manager of the lodge. Everyone we talked with flatly stated Charleston couldn't be climbed for another month, at least. These gloomy reports convinced my companion that the charms of Charleston Park were enough to satisfy any reasonable person. However, I have an almost pathological addiction to snow. So on June 13 I started up the trail at 7:15 A.M.

After the first mile the path disappeared under avalanche snow

and I never saw it again except in a few wind-swept spots near the summit. Four hours were required to gain the ridge, two of which were spent cutting steps in the frozen snow of the steep upper slopes. The only difficulty encountered, however, was breaking through the overhanging cornice at the top. After three and a half more hours laboring through the sun-pitted snow on the ridge the top was reached at 2:40 P.M. From Charleston's 11,910-foot summit can be seen points in California, Nevada, Utah, and Arizona. But easily the most dramatic single object is man made—Lake Mead, blue waters in a polychrome desert setting, fifty miles away. After a descent taking four hours and a half I stumbled into camp by flashlight at 8:00 P.M. Thirteen hours of snow climbing in mid-June in the most arid section of "the Great American Desert"!

"The Charlestons," as the Spring Mountain Range is called locally, deserve much more consideration than they have yet been given. Besides Charleston Peak, there are five or six other summits over 11,000 feet, and at least a dozen ranging from 9500 to 10,500 feet. The high, rugged group two miles east of Charleston looks particularly interesting for the rock-climber. These isolated mountains are also a veritable garden for the botanist; over 400 plant species have been collected in the mountain area alone. Between the yellow-pine belt and timberline is one of the largest stands of bristlecone pine (*Pinus aristata*) in the United States. Many trees reach a diameter of six to seven feet. These forests, the fine girdle of limestone cliffs, the deep canyons, and the superb panoramas of mountain and desert entitle "the Charlestons" to a very high rank among southwestern mountains.

The Evolution Region and the Black Divide

PART VI

A CLIMBER'S GUIDE TO THE HIGH SIERRA¹

BY ALAN M. HEDDEN AND DAVID R. BROWER

WELL back in the central High Sierra groups of rugged peaks stand along the crest, bordering broad basins filled with scattered rock gardens or the blue expanse of lakes, some fed by tiny residual glaciers. Here is concentrated an example of almost every essential part of the High Sierra scene—cathedral-like Mount Huxley as an exhibit of fine peak sculpture, the Enchanted Gorge for exotic cliffs, Mount Goddard for a superb off-crest vista of the Sierra climax, Colby, Grouse and Little Pete meadows for friendly campsites, and the Devils Crags to provide the challenge of jagged summits. This is Evolution country, a region that has remained the most remote section of the crest, for there is no one-day route into the heart of it for animals, and it is hardly more accessible to knapsackers.

The Evolution country lies sixty miles southeast of Yosemite and twenty miles southwest of Bishop, almost all of the region being within Kings Canyon National Park. Originating on its summits are the three forks of Bishop Creek, the Middle Fork of the Kings River, and the South Fork of the San Joaquin River. The crest of the Sierra in the north portion runs almost north-south, but soon changes to an east-southeast course to continue through the Palisades; at this turning point the Goddard Divide and its spurs extend to the west. The peaks are thus divided geographically into four sections: (1) peaks of the crest, (2) those west of the crest or north of the Goddard Divide, (3) those west of the crest and south of the Goddard Divide, and (4) those east of the crest. This, the natural grouping of the peaks, is used in describing them. The Mount Goddard quadrangle of the United States Geological Survey topographic map or the map accompanying Starr's *Guide* should be referred to for cartographic detail.

¹Regions covered in parts I-V are: Sawtooth Ridge, Ritter Range, Palisades, Yosemite Valley, Whitney Region. *S.C.B.* 22:1, 23:2, 24:3, 25:1, 26:1, 1937-1941, respectively. A few reprints of most parts are still available from the Committee on Mountain Records and Place Names.

HISTORICAL RÉSUMÉ

Had sheepherders spent their hours keeping notes instead of sheep, more might be known with respect to who, in this as in many other parts of the Sierra, may have been the first white—or nearly white—mountaineer. The first known record of exploration was that of the California Geological Survey party, led by William H. Brewer, who approached the region from the north in August, 1864. Four members of the party attempted to climb Mount Goddard from a camp about twenty miles distant, and of these, two, including Richard Cotter, companion of Clarence King on that year's first ascent of Mount Tyndall, all but made it. In a thirty-two hour walk, twenty-six without food, Cotter covered the forty-mile round trip, missing the summit, according to Brewer's journal, by just 300 feet. Next of record was John Muir, who in about 1873, according to Farquhar, "climbed the highest mountain at the head of the San Joaquin, which he supposed was one named [in 1864] by the Whitney Survey, Mount Humphreys. His description, however, clearly indicates that he was on one of the mountains a little farther south, probably Mount Darwin."

In 1879 Lil. A. Winchell's explorations took him to Mount Goddard, which he climbed with L. W. Davis; he returned to repeat the ascent in 1892. But the region was still practically unknown, and certainly unnamed. Then, in 1895, hoping to find a high mountain route which would connect the Kings River Canyon and Yosemite Valley, Theodore S. Solomons, with Ernest C. Bonner, left Florence Lake on July 12. Following sheep trails, they knapsacked up the south fork of the San Joaquin River and continued on into the Evolution Creek valley. At the head of what is now called Colby Meadow, a prominent mountain shaped like a sugarloaf suggested to Solomons a name, The Hermit, which he promptly bestowed. From here, also, he named the flat-topped Mount Darwin, Evolution Creek, Evolution Lake, and, to complete the homogeneity of the place names and honor the respective philosophers, Mounts Huxley, Fiske, Spencer, Haeckel, and Wallace. While returning to Evolution Valley the two men made an attempt on Darwin by the west wall, but were stopped about halfway to the summit by a sheer face. Retracing their steps to the junction of Evolution Creek and Goddard Canyon, they turned south and followed the canyon to its source, southwest of Mount Goddard, and made the third ascent of

this peak. Dropping down the southeast side of the Goddard Divide, Solomons and Bonner entered the deep Enchanted Gorge, passing through a gateway formed by two black metamorphic peaks, which became Scylla and Charybdis, and descended Disappearing Creek, then Goddard Creek, and finally the Middle Fork of the Kings to Tehipite Valley. Thus they succeeded in finding a route from Yosemite to the Kings. The complete route has seldom been used since, but the place names Solomons left behind—and almost all in the region are his—are some of the most pleasing in the Sierra.

In the summer of 1904 Joseph N. Le Conte, and Dr. G. K. Gilbert of the United States Geological Survey, made a trip similar to Solomons', but from the vicinity of Muir Pass they crossed into Goddard Canyon via Martha Lake, and thence climbed over what Le Conte named Hell-For-Sure Pass into the North Fork of the Kings.

The earliest United States Geological Survey map of the Evolution Region was the Mount Goddard Quadrangle of 1909. George R. Davis, its topographer, climbed extensively, naming Martha Lake and the Black Divide and being the first to climb Le Conte's Black Giant. R. B. Marshall, chief geographer for the map, named many landmarks: Mounts Powell and Thompson, after the Colorado River explorers, and Wanda and Helen lakes, after the daughters of John Muir.

The rest of the story follows a familiar pattern. Explorers had done their work. Then came two decades of scrambling, with the last of the important summits going down before the onslaught of members of high-mountain outings. Little roped climbing has yet been accomplished in the region, except among the Devils Crags. Yet a glance at the rugged terrain is enough to convince a rock-climber that there are still many excellent difficult routes to be pioneered.

TOPOGRAPHY AND ITS RELATION TO CLIMBING

In the Evolution Region, as in nearly all parts of the High Sierra, there is an easy way to climb almost every peak. In general, the peaks on the crest are most easily climbed from the southwest, while the northeast side provides higher, more vertical faces for the rock-

climber. The small glaciers of the region provide interesting routes for climbs of several peaks, such as Darwin, Goddard, and Mendel.

For the most part, the peaks of the crest are of sound granites, on which the climber need exercise no more than normal caution. A substantial part of the region is metamorphic, resembling the highly metamorphosed ancient lava of the Ritter Range. The Black Divide, Scylla, Charybdis, the Enchanted Gorge, Mounts McGee, Goddard, and the Black Giant are all, as many of the names imply, of dark rock, much of it beautifully sculptured. The beauty is not so apparent, however, to the rock-climber, who will find much of the metamorphic rock unsound and easily fractured. Chutes in the Devils Crags are particularly unsound, and should be avoided during storms.

The classification of difficulty is as used in previous parts of this guide; a detailed interpretation is presented by Morgan Harris elsewhere in these pages.²

APPROACHES AND CAMPSITES

From Bishop—Bishop Pass (11,989): At an elevation of 9750 feet, leave the end of the road which follows the South Fork of Bishop Creek. From here a horse trail continues from South Lake over Bishop Pass into Dusy Basin, then down into LeConte Canyon. Excellent campsites are found in Dusy Basin and at Grouse and Little Pete meadows in LeConte Canyon.

Piute Pass (11,409): The Piute Pass trail from the roadhead at North Lake leads past Mount Humphreys, then descends through Humphreys Basin and Hutchinson Meadow, following Piute Creek to its junction with the South Fork of the San Joaquin River. Here the Muir Trail may be followed up into the Evolution Region. Campsites are both good and plentiful anywhere along Piute Creek or the upper reaches of the South Fork, particularly on Evolution Creek.

Lamarck Col (about 13,000): This provides the most direct route for knapsackers into the Evolution Lake region. It is on the main crest about a mile south of Mount Lamarck. Almost immediately above North Lake on the Piute Pass trail follow the left or southern fork of the trail, which continues to what is known as Grass Lake. Shortly after reaching the level of the first bench, the

²*Op. cit.* parts III-V; see also page 75, this number.

trail again divides. Here the upper (north) branch is taken. The trail then leads to Lower Lamarck Lake, skirts its eastern and southern shore, continues to Upper Lamarck Lake, and leads along the spur forming the southern boundary of this upper lake basin. Switchbacks ascend west up to a long sand flat. Presently a second sand flat is reached, at which point the crest comes into view. Proceed toward the small pinnacle at the head of the col, passing to the left (south) of a small, high lake, almost directly below the pinnacle. The trail contours around the southern and then the western side of this lake, passing between the pinnacle and the lake. Switchbacks continue directly up to the pass, which is the small notch just to the right (north) of the pinnacle and not the lower and "apparent" gap to the left.

When the summit has been reached, the "trail," now no more than a route, drops down toward the middle lakes of Darwin Canyon. After a descent of several hundred feet, it ends altogether save for an occasional duck. It is not imperative to follow the ducks, for any route may be followed over the talus and down into Darwin Canyon. From the lower end of the canyon contour south to the Muir Trail at Evolution Lake. Good campsites are found up to 11,000 feet in Darwin Canyon.

From the North.—At Florence Lake, where the road from Fresno ends, a pack trail follows the South Fork of the San Joaquin River, joining the Muir Trail in Blaney Meadows; the Muir Trail ascends the South Fork into Goddard Canyon, and leads up Goddard Canyon to the Evolution Creek junction. A level, wooded campsite is situated on the west side of the Goddard Creek a short distance south of its junction with Evolution Creek. The Muir Trail, following Evolution Creek, winds up a steep canyon, past the beautiful Evolution Creek falls, and into three varied alpine meadows—Evolution, McClure, and Colby,—continuing on past Evolution Lake and over Muir Pass. With its vast supply of pasture, wood, water, and scenery, Colby Meadow is one of the finest camping spots in the Sierra.

On the south shore of the large peninsula which enters Evolution Lake from the east and about one hundred yards from the trail there is a fairly well sheltered campsite for a small group. With feed for a few animals, firewood, and an excellent view of the southern half of the lake, Evolution Lake, too, offers a fine camp for a short stop.

From the West—Hell-For-Sure Pass (11,833): One of the first routes of access to the Evolution country, but now seldom used, is from Dinkey, on the North Fork of the Kings, over Hell-For-Sure Pass, and down to Goddard Canyon. Knapsackers may easily travel directly up Goddard Canyon, taking the north branch for the Evolution Peaks or Muir Pass, or taking the main branch for Mount Goddard. Martha Lake, at the head of North Goddard Creek, is above timberline.

From Blackcap Basin it is readily possible to cross the saddle (11,850) just north of Mount Reinstein. There is good camping at Lake 10,237, near the head of Goddard Creek.

From the South—Mather Pass (12,050): The John Muir Trail descends Palisade Creek to its junction with the Middle Fork of the Kings River. Just north of this junction is Grouse Meadow, a perfect alpine valley. The canyon walls are superbly sculptured, tiger lilies abound, fishing is excellent, and the Devils Crags will tantalize any rock-climber. For climbs among them there is an excellent site high up on the south fork of Rambaud Creek at about 10,100 feet, where there is a small shelf settled in a little amphitheatre, surrounded on two sides by steep, waterstained granite walls, with a small lakelet nestled among groves of hemlock and albicaulis.

From Tehipite Valley: A spectacular route leads up the Enchanted Gorge, between its vertical walls and through its upper portals, Scylla and Charybdis. It is an arduous knapsack route, but the splendor of the canyon compensates for the effort. The customary route from Tehipite to the Evolution country is the trail up the Middle Fork through Simpson Meadow and past the Cartridge Pass trail junction.

PASSES

The Goddard Divide—Muir Pass: The one trail-crossing over the Goddard Divide is Muir Pass (12,059), the highest trail pass in the area. Here may be seen much of the outstanding beauty of the region. At the summit of the pass is the John Muir Memorial Shelter. Through the generosity of George Frederick Schwarz, the Sierra Club was able to build this stone hut in 1930. Since it is high above timberline, its fuel supply is strictly limited. Signs along the trail at the bottom of the pass advise the traveler of the last place to

get wood before beginning to climb to the hut. Every extra branch that he can carry to the pass is that much insurance that the weary traveler, caught in a storm, will be warm.

The hut consists of a single, circular room with sleeping space for several persons. The summit is level enough to provide numerous places for outdoor beds. Water can generally be found a short distance down the trail on either side, especially if the snows of the previous winter are still present.

Black Giant Pass—From Muir Pass the best way to reach the head of the Enchanted Gorge is by means of a broad, easy knapsack pass about three-fourths of a mile due west of the Black Giant and about one-half of a mile north of a large lake in the headwaters of Disappearing Creek.

Glacier Divide—At the eastern end of the Glacier Divide are two excellent but rocky knapsack passes connecting Piute Pass with Evolution Lake. From Piute Pass go southwest to Muriel Lake. Above the head of the southeastern tributary to this lake is a low notch, The Keyhole (12,550), so named because the climber must pass through it rather than over it. On the west side the slope drops sharply to a small lake basin, which is descended to its junction with Darwin Canyon.

Another tributary to Muriel Lake, which enters from the southwest, leads to a large basin filled by Lake 11,511. Above the southeastern end of this lake a small tributary stream comes down the ridge wall from a small notch, Alpine Col, which leads into the same lake basin and down to Darwin Canyon, thence to Evolution Lake.

PEAKS OF THE CREST

PEAK 13,162

Class 2. First ascent, July 3, 1939, by James R. Harkins, Fred L. Tobi, and Herbert L. Malcolm on a traverse of the crest from north to south. Class 3 by this route. Estimated as class 2 from the head of the north fork of Lamarck Creek.

MOUNT LAMARCK [13,450]

Class 1. First ascent by Norman Clyde in the summer of 1925, who found it an easy scramble from the south.

PEAK 13,252

Class 2. First recorded ascent by Norman Clyde in the summer of 1925; however, he found a cairn.

MOUNT DARWIN [13,841]

The broad, nivated summit table of Mount Darwin, a unique feature of Evolution terrain, is a fascinating indication of what the ancient Sierra was like, before the great uplifts and the extensive glaciation. It is particularly odd that an unsteady-looking pinnacle, well detached from this summit plateau and southeast of it, is actually the highest point.

The first ascent on record was made by E. C. Andrews, Geological Survey of New South Wales, and Willard D. Johnson, of the United States Geological Survey. However, it is quite possible that John Muir climbed this peak in 1873 instead of Mount Humphreys, which he thought he was climbing at the time. Darwin offers one of the better opportunities for rock-climbing in the entire region. Theodore S. Solomons realized this in 1895 when, with E. C. Bonner, he was turned back on an attempted ascent from the Evolution Lake side. But even though this western side has now been climbed by many parties, there are still several possible routes to pioneer among the maze of avalanche chutes and towers of Darwin cliffs.

Route 1: From Evolution Lake.—Class 3. First ascent by Andrews and Johnson, August 12, 1908. Although their exact route is not known, it seems to parallel closely that of Walter A. Starr, Jr.: From near the south end of Evolution Lake ascend a small tributary east of the lake, through meadows leading to the base of the west face. Here cross to the left (north) to the base of the third of three talus fans, counting from south to north, and ascend the chute from which the fan emanates. Midway to the crest this chute branches, and the right-hand (south) branch is followed to the saddle just above the first pinnacle on the right (south) side of the chute. By a series of easy ledges drop down into the middle chute and continue up its right-hand (south) side to an indented trough, which leads to the crest of the main shoulder. The only difficulty yet to remain in traversing to the flat summit is a knife-edge which must be straddled. The register is reached by a leisurely jaunt to the southeast end of the broad, sandy top.

The chutes forming the first and second talus fans may also be climbed; thus the knife-edge may be avoided. The climber must be prepared, however, to cross from one chute to another frequently. No one has yet determined which combination of chutes and traverses is best.

Route 2: Via glacier and west ridge.—Class 3. First ascent by Robert M. Price and Peter Frandsen, August 21, 1921. Between Mounts Mendel and Darwin, and on the crest, is a large notch with a smaller one about one hundred yards farther to the east. In an approach from the north via Darwin Canyon the glacier presents a problem. If weather is favorable and adequate equipment is available, the quickest route is directly up the glacier to the bergschrund, over it if possible, and on up to the smaller, eastern notch. The easier but longer route is to skirt the right (west) side of the glacier and then traverse above it from west to east to any of several routes to the small notch. The route from the notch then follows route 1 to the plateau.

Route 3: North face.—Class 3. First ascent by David R. Brower and Hervey H. Voge, July 5, 1934. Two ribs or arêtes run down the north face, partly dividing the glacier. The east (left) side of the east rib, which lies one quarter of a mile west of the northeast ridge, is ascended a short distance over talus and snow. The route then goes up onto the rib itself and ascends, via easy ledges, up to the point where the rib merges with the face. Here a moderate pitch is passed by a crack to the left (east), and the final climb to the summit may be made via a small chimney having an overhanging south wall and containing several large, loose blocks.

Summit Pinnacle.—Class 4. The detached summit pinnacle was first climbed by E. C. Andrews on August 12, 1908; he descended into the chimney east of the arête between the summit and pinnacle, thence reaching the top by means of a "monstrous icicle," referring doubtless to the snow tongue which lies in the chimney well into the summer. Ascent of this chimney fortunately does not depend upon the existence of the monstrous icicle. It is a rock scramble permitting several variations, exposed just enough to warrant a belay for the unsteady. A more direct, but also more exposed route is to follow the arête from the plateau to the pinnacle. The horizontal slabs of the final pitch are more substantial than they look, and the fractures provide good holds.

PEAK 13,332

Class 3. Climbed on July 19, 1933, by Glen Dawson, Neil Ruge, and Bala Ballantine. There was no evidence of previous ascent.

MOUNT HAECKEL [13,422]

Route 1: West shoulder.—Class 2. On July 14, 1920, a party of nine climbers, led by Walter L. Huber, left Evolution Lake, going around the west shoulder of Mount Spencer, and climbed into a small basin between Mounts Spencer and Huxley. It appeared fairly easy to reach the top of the crest on the opposite side of the basin, but then to traverse the ridge to the summit would have required a long, tedious climb over many serrations. A faster way, however, seemed to be to cross to the left of the basin and then to pass through a chute to the top of a ridge which joined the crest just south of the summit. This route was followed; beyond the junction of this west ridge with the crest the only serious obstacle was a vertical face of about 30 or 40 feet. Excellent handholds, however, facilitated the climb, and the summit was but a few steps farther.

Route 2: South ridge.—Class 2. First ascent by Edward O. Allen, Francis E. Crofts, and Olcott Haskell, also on July 14, 1920. They followed a longer route, going directly across the amphitheatre, climbing to the saddle between Haeckel and Wallace (13,328), and traversing the sawteeth to the summit. They were quite surprised to find that they had been beaten to the summit by a matter of minutes. Yet, still greater was their surprise on learning that they had not, as they had intended, climbed Mount Darwin.

Route 3: North face.—Class 3. The first ascent was made on July 20, 1933, by Jack Riegelhuth, who climbed up the northwest chimney and then the north face to the top.

Route 4: Northeast ridge.—Class 2. On August 8, 1935, Merton Brown, O. H. Taylor, and Angus E. Taylor reached the larger of two arêtes on the northeast side of the summit. Here Brown climbed the slabs to the lower and then the higher summit. The Taylors ascended the arête, traversing to the crest at about the point where the west shoulder joins it.

MOUNT WALLACE [13,328]

On an early edition of the Mount Goddard quadrangle, Mount Wallace was erroneously placed upon the 13,701-foot peak north-

west of Darwin. On the present edition it is still, according to Solomons who named it, incorrectly marked as the peak at the junction of the Goddard Divide and the crest. The correct Mount Wallace is peak 13,328, on the crest about one-half mile north of the junction of the Goddard Divide and the crest.

Class 2. First ascent by Theodore S. Solomons, July 16, 1895. From the amphitheatre west of the summit climb up a rock-filled chute that leads to a splintered wall whose highest point is the summit.

CLYDE SPIRES [13,300 CA.]

Between Mounts Wallace (13,328) and Powell on the main crest are two small granite spires. The north spire was first climbed by Norman Clyde, Jules Eichorn, Theodore Waller, Helen LeConte, Julie Mortimer, Dorothy Baird, and John D. Forbes, July 22, 1933. The south spire was ascended the same day by Clyde, Eichorn, and Waller, and proved to be a difficult slab climb. The spires were named for the party's leader.

MOUNT POWELL [13,361]

Route 1: South plateau.—Class 2. First ascent August 1, 1925, by Walter L. Huber and James Rennie. From Helen Lake climb an intervening ridge of about 12,200 feet, drop down several hundred feet into a small cirque. Then climb the ridge just south of the summit and follow the long, barren plateau to the top. The final peak is a huge summit block where "a careless step might result in a drop to the glacial ice far below under the north face."

Route 2: Northwest chute.—Class 3. First ascent by Norman Clyde on June 29, 1931, who described it as "an interesting climb from the northwest."

MOUNT THOMPSON [13,494]

The first ascent of this peak, which marks the junction of Thompson Ridge with the main crest, was made by Clarence H. Rhudy and H. F. Katzenbach in 1909. Their route is unrecorded. Several routes have since been used. Norman Clyde made the climb on June 30, 1931, and considered it an "excellent rock climb by the west face." It is not clear from the map, however, which side of the west ridge was thought to be the west face. On September 7, 1931,

Clyde ascended from the northwest, describing the route, "a difficult rock climb . . . in the lower portion." Jack Sturgeon, on August 14, 1939, climbed via some steep slopes and a narrow chute on the southwest face, believing it to be class 2.

MOUNT GILBERT [13,232]

First ascent by Norman Clyde on September 15, 1928. Clyde described it as an "easy ascent except for a chute which may at times be icy; no cairn." On August 14, 1939, Jack Sturgeon followed the crest and climbed it via the southeast slopes, reporting a cairn but no other record of previous ascent. The disappearance of Clyde's name in the intervening eleven years is not hard to account for. Even moderately well built cairns have been known to disappear from Sierra summits, probably as a result of snow or storm.

MOUNT JOHNSON [12,850]

Class 2. Jack Sturgeon, who ascended the peak August 14, 1939, by way of the western arête, reported that it had previously been climbed twice by Clyde.

MOUNT GOODE [13,068]

Class 1. The first recorded ascent via the southeast face was made by Chester Versteeg, July 16, 1939; a cairn was found but no names. An ascent of the south ridge was made by Jack Sturgeon on August 12, 1939, while traversing the crest from Bishop Pass to Thompson.

PEAK 12,903

Class 1. On July 12, 1939, Chester Versteeg made the first recorded ascent of the higher summit. Norman Clyde, in 1936, climbed the lower but more difficult summit, which Versteeg considered to be class 3.

PEAKS WEST OF THE CREST, GODDARD DIVIDE AND NORTH

MURIEL PEAK [12,951]

First ascent on July 8, 1933, by Hervey H. Voge, who described it as "an easy rock-climb from the west."

PEAK 13,277

Class 1. First recorded ascent by David R. Brower and George

Rockwood on July 6, 1933. This, the highest point on Glacier Divide, is an easy ascent from the east.

PEAK 12,741

Class 2. First ascent July 5, 1934, by David R. Brower, who climbed the south side and descended the west ridge. There is some scrambling among the large blocks of the summit ridge. Brower could not determine which end of the ridge was higher.

MOUNT MENDEL [13,701]

This peak was for many years erroneously labeled Mount Wallace on the topographic map. It now bears only the elevation; hence, among climbers, it soon acquired the inelegant name of "Ex-Wallace." "Mount Mendel," originally proposed for a lesser peak in the region, is used here.

Class 3. First recorded ascent by Jules Eichorn, Glen Dawson, and John Olmstead, July 18, 1930, who found a cairn. They considered that the chimney by which they ascended was more difficult than the climbing of Darwin. It is quite possible that the first ascent was made in error by climbers, seeking the summit of Darwin, who started climbing, as has so often been done, too far north along the shores of Evolution Lake. Often climbers bound for Darwin have ended up in the difficult crags north of Mendel.

The easiest route up Mount Mendel is readily apparent from The Hermit. About 400 yards along the Muir Trail south of the peninsula jutting into the lower end of Evolution Lake, a massive buttress of glaciated granite descends from the peak, in contrast to the extensive accumulation of talus bordering the lower half of the east shore. Ascend this buttress for 1500 feet, diagonally up and southward, until the glaciated granite gives way to the broken rock of the summit mass. Then continue upward by crossing right (southeast) to a talus fan—the first fan southeast of the buttress—and ascend this fan into the chute from which it emanates, keeping in the north branch of the chute, to the notch and its head. Traverse north along the broken and serrated ridge to the summit.

The most spectacular snow couloirs in the Sierra descend to the north. So far as known, these have not been attempted. Climbers who would explore them are urged first to investigate them from below, in Darwin Canyon.

MOUNT SPENCER [12,428]

Class 1. First climbed by Robert M. Price, George J. Young, H. W. Hill, and Peter Frandsen, on August 20, 1921. From one-half mile above Evolution Lake ascend one and a half miles east to 11,600 feet on a tributary to the creek, climb over broken granite and talus to the east saddle of the peak, thence westward and up to the summit. The saddle is as easily reached from the lake basin east of Sapphire Lake.

MOUNT FISKE [13,560]

Named in 1895 by Theodore S. Solomons for John Fiske, historian and philosopher, this peak was first climbed by Charles Norman Fiske, John N. Fiske, Stephen B. Fiske, and Frederick Kellet, on August 10, 1922.

Route 1: Southeast ridge.—Class 1. First ascent by the above party on August 10, 1922. From Muir Pass contour at about 12,000 feet around the southeast side of the Peak 13,223, and then drop down about 200 feet to the small lake to the northwest of Helen Lake. A steady climb leads to the southeast peak, whence the ridge is followed to the summit.

Route 2: Southwest ridge.—Class 2. First ascent on August 18, 1939, by Jack Sturgeon, who traversed from Peak 13,233 and the basin to the south, ascending by way of the southwest arête. The southwest saddle is easily accessible from the group of lakes, nestled between Fiske and Huxley, draining into Sapphire Lake. The nivated slope east of this ridge provides a class 1 route.

MOUNT HUXLEY [13,124]

Class 2. First ascent by Norman Clyde on July 15, 1920. From the trail on the first bench above Sapphire Lake, ascend the southern side of the western shoulder until the angle steepens appreciably, then continue up the shallow chute, which empties almost on the shoulder itself, to the slabs and large blocks of the sharp summit arête. Descent of the southwest chute and face may require the use of rope. Such a descent was made in July, 1939, by a Sierra Club outing party, and required a short rappel.

PEAK 13,223

Class 1. First ascent in 1926 by Nathaniel Goodrich and Marjory

Hurd. This is an easy traverse from either Muir Pass or Huxley. The best opportunity for rock-climbing is found either on the east face or in the small cirque to the north of the summit, between Huxley and Fiske, but no climbing has been recorded there.

PEAK 13,070

Class 1. First ascent by Jack Sturgeon on August 16, 1939. An easy climb by the northeast ridge or almost anywhere on the south slopes.

MOUNT GODDARD [13,555]

The early history of the Evolution Region is, in many respects, the early history of Mount Goddard. Many were the explorers who were enamoured of its summit, and for good reason; it was not only one of the highest summits in the range, but also it was well isolated, distinctly set off to the west of the crest, and could promise a unique view and admirable triangulation station for topographic mapping. Members of the Whitney Survey viewed the peak from far to the south in 1864, named it in honor of civil-engineer George Henry Goddard, attempted to climb it twice, and estimated the height to be 14,000 feet. It was not climbed, however, until fifteen years later, when, on September 23, 1879, Lil. A. Winchell and Louis W. Davis made the first ascent. By 1912 fifty persons had climbed to the summit; the ease of the ascent and the commanding view of over 100 miles of the Sierra made it the most traveled peak of the region at that time.

Routes.—There are class 1 routes up the talus of the southwest ridge from Martha Lake, and up the east slopes rising from the head of the northernmost tributary to Goddard Creek. Neither of these routes are readily accessible, however, from the most frequented trails. Walter Starr, Jr., has given a detailed description of the class 2 approach from the Muir Trail, which is essentially as follows:

At the lower end of Wanda Lake ford the outlet, cross the saddle to the southeast at its lowest point, and descend into the rocky basin beyond. Continue almost due south across the basin, fording several small streams some distance above Davis Lake, and proceed toward the very steep spur which ascends from the floor of the basin southward to the crest of the Goddard Divide. Rock-climbers may pro-

ceed straight up the very steep top of the ridge from the floor of the basin. Those who prefer snow climbing may work their way onto the buttress higher up from the snow on the right. A short distance below the crest, where the buttress becomes almost perpendicular, a ledge leads around the left side, above the long snowfield, and comes out on the crest to the left of the point at the top of the buttress. From here a long talus slope leads up the crest to the summit. There is a double summit, the farther peak being higher.

PEAK 12,279

First recorded ascent on July 11, 1939, by Jerome C. Draper, Jr., Howard Wurlitzer, and Rymund Wurlitzer, who found a cairn. A class 1 climb from the east.

MOUNT MCGEE [12,966]

Mount McGee dominates the westerly panorama from Muir Pass. Sharply sculptured, dark with metamorphic rock, it is situated just far enough from the Muir Trail to have discouraged most climbers who might have liked to reach the summit. It may be approached from Goddard Canyon, Colby Meadow, or from Wanda and Davis lakes. It was first climbed July 11, 1923, by Roger N. Burnham, Robert E. Brownlee, Ralph H. Brandt, and Leonard Keeler; their route is unrecorded.

Route 1: North chute.—Class 4. First ascent by Glen Dawson, Charles Dodge, Jules M. Eichorn, John Olmstead on July 16, 1930. From Colby Meadow proceed up McGee Canyon directly toward the summit, turning southwest when past timberline, to climb over moraine and talus toward a spur, at the base of the west peak, which resembles a massive inverted shield. Ascend the ridge that circles west of the residual glacier, and which deflects toward the west the drainage from the mouth of the steep snow chute cleft in the north face of the peak, but well to the west of its center. It is usually possible to ascend this chute along the edge, where the snow has melted back from the rock wall. The last 800 feet of the chute is exposed enough to merit use of the rope for safety. From the notch at the top of the chute proceed east along the well-broken ridge to the summit.

Route 2: West face.—Class 2. First ascent by Glen Dawson, Neil Ruge, and Bala Ballantine on July 17, 1933. From Goddard

Canyon ascend the east fork of North Goddard Creek to 11,000 feet, proceed up and northwest to the base of the west face, and ascend the talus to the summit of the west peak, traversing from there into the notch at the head of route 1.

Route 3: South chute.—Class 1. (Probably the route of the first ascent.) From the lower end of Davis Lake ascend the broad fan of scree and talus to the prominent chute ending in the notch between the west and east summits, ascend the scree in this chute to the notch, and proceed east to the summit. The sliding nature of the scree makes this route a bit disagreeable as a means of ascent.

PETER PEAK [12,514]

Class 2. First ascent on July 11, 1936, by Peter Grubb and Richard G. Johnson. Ascend to the northeast notch from the head of McGee Canyon, and ascend the ridge to the summit. Grubb and Johnson also climbed the eastern buttress of the peak when making the first ascent. The metamorphic rock of the peak, and particularly of the chute leading to the notch, is quite unsound. One must "hold the mountain together with one hand while he climbs it with the other."

EMERALD PEAK [12,517]

Class 2. First ascent made by Norman Clyde, Julie Mortimer, and Eleanor Bartlett, August 8, 1925. From Evolution Meadow ascend the steep south wall of the canyon and continue over the gradual slope above to the north base of Peak 11,764. It is perfectly feasible to traverse this peak and continue up the northwest ridge of Emerald Peak to the summit, but it will be found easier to contour a mile at 11,000 feet (timberline) until almost due west of the peak, thence continuing over talus and nivated slope to the top.

THE HERMIT [12,352]

The cleanly sculptured granite of The Hermit culminates in an inviting summit that dominates the view from Colby Meadow. It was first ascended by George R. Bunn on July 28, 1924, but his route is unrecorded.

Route 1: From Evolution Lake.—Class 2. The easiest and most used route is to cross just below Evolution Lake, contour to the base of the peak, and climb the eastern talus chute to the notch just south of the summit, traversing from there to the summit. The final sum-

mit monolith was ascended in 1925 by James Rennie and Norman Clyde. Bunn had declared that the 20-foot summit slab was unclimbable. It was climbed, however, by sixty-five persons in three days in July, 1939. Because of the exposure, a rope is recommended for the final pitch. A shoulder stand is usually used and dexterity is required.

Route 2: From McGee Canyon.—Class 2. Ascend McGee Canyon to 10,400 feet and proceed east up the first tributary to the small lake that feeds it; thence ascend over talus and scree to the top of the chute heading in the notch south of the summit and continue as in route 1. Special care should be taken to avoid loosening the rocks in the chute.

Route 3: North ridge.—Class 3. First ascent July 9, 1936, by Richard G. Johnson and Peter Grubb. From Colby Meadow ascend through forest and over easy, open granite to a shelf on the north shoulder, usually sheltering a snowbank, just beneath the high-angle granite slabs of the final 1000 feet of the summit. From here traverse to the left (east) under the cliffs and proceed diagonally up and westward over granite slabs, now more broken and at a lower angle, to the final summit pitch, which must be reached by traversing to the south of the peak, 25 feet below the summit.

Route 4: Northwest face.—Class 3. First ascent July 9, 1939, by Harriet Parsons, Madi Bacon, and Maxine Cushing. Follow route 3 to the snow-bearing shelf. Here a broad ledge extends up around the west face to a chute leading back to the shoulder, but above the cliffs that shelter the snow. Continue over the steep but broken ridge to the summit, as in route 3.

Peak 12,341, one half mile southeast of the summit, erroneously bore the name of The Hermit on an earlier edition of the map. It was first climbed by Dr. Grove Karl Gilbert and Mr. Kanawyer, the packer, in 1904. It is an easy climb by several routes.

SOUTH OF GODDARD DIVIDE

South of the Goddard Divide, between LeConte Canyon and the White Divide, is the wildest part of the High Sierra. Perhaps no more than four parties have been through the Enchanted Gorge since its discovery. Only the peaks at either end of the Black Divide have, so far as known, been ascended. Of the Ragged Spur peaks, only Scylla has been climbed, and that but once. Place names

are rather far between. From the map it is apparent that the Geological Survey parties were not too familiar with the topography. Lack of trails, rugged terrain, high altitude and low timberline, remoteness, and the lack of any great number of mountaineers who would prefer to cope with these conditions—all this has contributed to the final result: a knapsacker's wilderness, as black, ragged, and enchanting as its place names.

Black Giant Pass (12,250) provides the knapsackers' best approach from Muir Pass to the headwaters of Disappearing Creek, *Ionian Basin*. Waters from the basin's many lakes, several unmapped, gather between the two peaks, Scylla and Charybdis, and pause there in long and narrow *Chasm Lake* before their plunge into the dark and Enchanted Gorge.

Farther south along the Black Divide is *Ladder Lake*, in the cirque almost enclosed by the 10,500-foot contour, three miles south of Langille Peak; rising sheer above and east of the lake is *The Citadel* (11,750), one of the most beautiful crags in the Sierra, and apparently unclimbed; still southward, at the very head of Rambaud Creek is *Wheel Mountain* (12,778). Black Divide terminates in the Devils Crags, where the imaginations of those who bestow names failed, and the black crags are known only by numbers.

The italicized names are new, and do not appear on the map. Perhaps it is best that they never do. For then each traveler may indulge his imagination, naming the crags, lakes, and waterfalls to suit his own fancy. But he must take his names with him when he leaves, that other travelers may indulge in name-giving likewise, likewise leaving no record. Then perhaps these wild places, lacking the labels that are ubiquitous elsewhere in the Sierra, will remain the wilder.

SCYLLA [12,943]

First ascent by David R. Brower and Hervey H. Voge on July 3, 1934. Class I. From Muir Pass, cross Black Giant Pass and contour at an elevation of about 12,000 feet along the north slope of Ionian Basin, past Lake 12,002 to the lake just north of Scylla (this lake does not drain west into Goddard Creek, as shown on the map, but into Disappearing Creek by three outlets). From here the route to the summit is an easy scramble. The best rock-climbing near the peak will probably be found on the sharp crags just to the east.

CHARYBDIS [13,077]

First ascent on July 7, 1931, by Anna and John R. Dempster. Class 2. Cross Black Giant Pass to the large lake at the head of the east fork of Disappearing Creek and follow up the northeast ridge, going somewhat to the south of the ridge at times. There are several chutes on the north face, any of which may be used. The first ascent was made by the chute leading directly south to the summit.

PEAK 13,012

First ascent by M. H. Pramme and T. F. Harms on August 12, 1929. It is an easy class 2 climb direct from Muir Pass via the northeast shoulder or by the snow chute which heads in very loose rock just under the flat summit. By way of the southwest ridge it is a class 1 climb, but the ridge itself is remote. The summit affords a striking view of Scylla, Charybdis, and Ionian Basin.

PEAK 12,818

First ascent by Kenneth Davis and John U. White. No record was found. A class 1 climb from Muir Pass via the west slope.

BLACK GIANT [13,312]

First ascent by George R. Davis in 1905. Along the western side the climb is little more than a class 1 rock scramble. But on the eastern side the whole ridge is sharply broken off. Any ascent from this side would be considerably more difficult.

PEAK 12,114

First ascended by George R. Davis and George W. Hoop on August 19, 1907. A class 2 traverse from Langille Peak; a class 2 climb by the southwest ridge.

LANGILLE PEAK [11,981]

First ascended in 1927 by Nathaniel L. Goodrich, Marjory Hurd, and Dean Peabody, Jr. The route of their ascent is unrecorded; they descended by the south face—a vast glaciated granite apron of polished smoothness (class 3). The first ascent by this route was made by Glen Warner and Suzanne Burgess on August 5, 1941: From LeConte Canyon ascend the tributary opposite the Dusy

Branch and climb the cirque wall just north of the prominent waterfall above 11,000 feet. Traverse to the north onto the west ridge, and follow this to the summit.

PEAK 12,629

First recorded ascent by Chester Versteeg on July 14, 1939. An easy class 1 climb either by the southeast ridge or from Dusy Basin on the south.

RAMBAUD PEAK [11,023]

Class 2. First ascent in 1925 by Albert Tachet and Ruth Prager. This is a scramble from Rambaud Creek campsites to the north, and is an excellent point from which to study the Devils Crags.

PEAK 12,566

Class 2. First ascent August 5, 1941, by Glen Warner and Suzanne Burgess. From Le Conte Canyon ascend the tributary opposite Dusy Branch to 10,500 feet, climb the chute leading to the notch just south of the summit. A narrow snow chute provides a class 3 route up the north face.

DEVILS CRAGS [12,612—11,000]

The Devils Crags are about two miles southwest of Grouse Meadow and form the southern end of the Black Divide. They are slightly over a mile in length, have a northwest-southeast trend, and the highest crag is at the northern end. Although several systems of numbering have been employed, the system here used numbers only those crags which rise 150 feet or more above their notches. Since this nomenclatorial system is rather recent, the numbers in the crag registers will not always be in agreement. There are eleven crags, and the routes of ascent lie, generally, in their neighboring chutes. From the southwest the chutes which are fairly easy to climb are those between crags 2-3-4, 6-7-8-9-10. From the northeast, they are 2-3, 4-5, 8-9.

HIGHEST [12,612]

Route 1: Southwest face.—Class 3. First ascent made by Charles Michael on July 21, 1913. Two chutes on the southwest face cross each other forming an X. Climb the left (northwest) chute to the junction, where the most direct route is to continue on straight across,

following the upper right-hand chute nearly to the summit and then swinging to the left to the arête and following it to the top. An alternate and simpler route is to take the upper left-hand chute at the intersection, following it to the arête, and climbing along the arête to the summit.

Route 2: Northwest arête.—Class 3. First ascent by Jules Eichorn, Helen Le Conte, and Alfred Weiler on July 25, 1933. Follow the crest of the northwest arête to the summit.

Route 3: Northeast face.—Class 4. First ascent by Raffi Bedayan, Kenneth Davis, and Jack Riegelhuth, on August 5, 1938. From the upper end of the lake at 10,450 feet on Rambaud Creek, proceed southeast half a mile to the notch just under and northeast of the face; this is the roping-up place. Traverse to the right (northwest) and up over somewhat loose rocks of a delicate pitch to the chute marking the middle of the face, planning the traverse so as to end well above the overhanging lower portion of the chute. Ascend this chute toward the summit over rock that is fairly sound. Belay positions are, for the most part, good. When 35 feet below the summit, cross to the north wall of the chute, ascend a high-angle pitch to the summit ridge, and scramble to the top.

CRAG 2 [12,350]

Class 4. First ascent by Jules Eichorn, Glen Dawson, and Ted Waller on July 26, 1933. Climb the first chimney south of the main peak on the northeast side. It is most difficult in the lower portion. From the notch the ridge is easily climbed to the summit. From the southwest it is possible to climb the chute that heads between Crag 2 and the subsidiary crag just to the north. From the notch follow the arête.

CRAG 3 [12,350]

First ascent by David R. Brower, Hervey Voge, and Norman Clyde on June 24, 1934.

Route 1: From the northeast.—Class 4. Climb the northeast chute between crags, remaining on the floor of the chute and passing under the huge chockstone. From the notch climb the first pitch by the left side of the broken face. Contour out and up on the broad, sloping ledge on the north face to the north arête. Climb the left side of this to the northwest arête, and thence to the summit. With

little more difficulty the northwest arête may be followed from the notch.

Route 2: Traverse.—Class 4. The southeast arête may be descended 250 feet without too much difficulty. Descend a sloping, broken ledge heading on the east side of the peak. Follow this down and to the south, traversing easterly to a very broad shelf when the angle becomes too severe. Climb down an additional 60 feet just west of the southeast arête. Ensuing overhangs will suggest roping down into the notch between Crags 3 and 4. Descend via the southwest chute. If this route is used for an ascent, pitons are necessary for safety while climbing the largest overhang, 190 feet above the notch.

Route 3: From the southwest.—Class 3. Climb the southwest chute between Crags 2 and 3 to the 2-3 notch, following route 1 from the notch.

CRAG 4 [12,250]

Class 3. First ascent by David R. Brower, Hervey Voge, and Norman Clyde on June 24, 1934. From the southwest reach the 3-4 notch and follow the much-broken westerly side of the northwest arête to the summit. Descend the same route. A traverse would involve an 800-foot descent on a steep, ledgeless face.

CRAG 5 [12,250]

Class 3. First ascent by David R. Brower, Hervey Voge, and Norman Clyde on June 25, 1934. From the northeast climb the floor on the northeast chute between Crags 4 and 5, keeping to the left branch at the extreme top. From the notch contour into the shallow western chute, up which there are several variations in route to the arête above. Follow the arête to within about 25 feet of the summit monolith, contour around the western side, and walk up the south debris to the summit. There are several routes of descent on the southeast arête.

CRAG 6 [12,250]

Class 3. First ascent by David R. Brower, Hervey Voge, and Norman Clyde on June 25, 1934. From the northeast follow the arête from the Fifth Crag to the 5-6 notch, and ascend the west side of the northwest arête.

CRAG 7 [12,250]

Class 3. First ascent by David R. Brower, Hervey Voge, and Norman Clyde on June 25, 1934. From the northeast walk up the northwest arête from the 6-7 notch, which has been reached by the traverse of Crags 5 and 6. Descend southwest chute, roping down in the lower part.

CRAG 8 [12,250]

Class 2. First ascent by David R. Brower, Hervey Voge, and Norman Clyde on June 25, 1934. From the southwest climb the southwest chute between Crags 7 and 8, and follow the northwest slope to the summit.

CRAG 9 [11,950]

First ascent by Glen Dawson and Jules Eichorn on August 1, 1933. *Route 1: From the northeast or the southwest.*—Class 4. Climb to the notch between Crags 8 and 9 by either the northeast or southwest chutes. From the notch climb up and slightly to the right to the west arête, which is followed just below and to the north of its crest to the summit.

Route 2: Traverse.—Class 4. A traverse involves little climbing and two rope-downs into the 9-10 notch, from which one may descend by traversing Crag 10.

CRAG 10 [11,950]

First ascent by David R. Brower, Hervey Voge, and Norman Clyde on June 23, 1934. *Route 1: From the northwest.*—Class 4. Traverse Crag 9 to the 9-10 notch, and follow to the west of the crest of the northwest arête to the summit. *Route 2: From the southeast.*—Class 2. Climb the northeast chute between Crags 10 and 11 to the 10-11 notch. Traverse to the northwest, over a subsidiary crag and along the arête to the summit.

CRAG 11 [11,950]

Class 4. First ascent by David R. Brower, Hervey Voge, and Norman Clyde on June 23, 1934. Climb the northeast chute between Crags 10 and 11 to the 10-11 notch. From the notch climb up 10 feet, traverse a short distance on an exposed and loose ledge, and climb up an additional 10 feet to the flat top of the arête. This offers a good belaying position for the next pitch. Traverse west-

ward about 10 feet, using the top of a large semi-detached slab for handholds, turn back and climb a short distance on broken rock to the next shelf. The climbing to this point is rather exposed, and should be well belayed. From this point a short, unexposed climb on small holds leads to the summit. It is also possible, in climbing from the first shelf to the second, to contour out over the east face and up, but holds are few, the leader out of sight, and the lead is of about 25 feet.

MOUNT WOODWORTH [12,214]

First ascent by Professor Bolton Coit Brown on August 1, 1895, who climbed straight up the southwest spur, and above this followed along the base of the jagged spires bounding the southern face. Class 2.

WHEEL MOUNTAIN [12,778]

First climbed on July 26, 1933, by Marjory Bridge, John Cahill, Lewis F. Clark, and John Poindexter. Class 2. Climb from the lakes at the head of Rambaud Creek to the basin south of the peak. Traverse the ridge and plateau on the south and west. Ascend the ridge on the northwest to the summit. Descend by means of two steep gullies on the south face.

PEAKS EAST OF THE CREST

PEAK 12,702

Class 2. First ascent by John Cahill and Neil Ruge on July 9, 1933. This peak is one and a half miles southeast of Piute Pass, and is climbed from the north fork of Lamarck Creek.

PEAK 11,247

Class 1. First ascent by Chester Versteeg on July 21, 1939. An easy climb from Lake Sabrina southeast and up to the summit monolith, where a shoulder stand is required.

PEAK 13,202

First recorded ascent of this peak, which is one mile southeast of Lamarck, was made by Norman Clyde in 1925, but the route is not recorded.

PEAK 11,827

Class 2. First ascent by Angus E. Taylor on July 29, 1936. This peak is about 2 miles south of Lake Sabrina, and is an easy climb from the west and south except near the summit.

PEAK 12,993

First ascent by Norman Clyde on November 7, 1931. A class 1 climb along the east arête, and a class 2 climb from the southeast face. The peak is about 2 miles north of Mount Thompson.

HURD PEAK [12,224]

Class 2. First ascent by H. C. Hurd in 1906, route unknown. It is a class 2 climb, from Treasure Lakes via the west face.

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SIERRA CLUB

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THE PURPOSES OF THE CLUB ARE: *To explore, enjoy, and render accessible the mountain regions of the Pacific Coast; to publish authentic information concerning them; to enlist the support and cooperation of the people and the Government in preserving the forests and other natural features of the Sierra Nevada*

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Memorials

WALTER FRY OF GIANT FOREST

BY FRANCIS P. FARQUHAR

Those of us who knew Judge Fry during the latter part of his long life recognized in him a man of rare spiritual qualities. He knew and loved the tender and delicate forms of nature—the smaller flowers, the little folk of the forest. Fawns and seedlings engaged his attention. He was kindly and gentle, and people loved him.

Walter Fry lived a great deal of his life among the Big Trees, the great sequoias of the Sierra Nevada. It became the great object of his life to understand these trees and to preserve them, and rarely has any man been more successful in his purpose. For forty years he was in government service connected with Sequoia National Park. He began as a foreman of road construction, in 1901, and, in 1905, was appointed park ranger. During the winters, when the Army superintendents were away, he took full charge until, in 1914, he became superintendent of Sequoia and General Grant national parks. On July 15, 1920, he was appointed United States Commissioner for the parks, an office which he conducted with dignity and with special firmness in cases involving threats to the safety and peace of the Big Trees. In later years Judge Fry served also as ranger in charge of natural history at Giant Forest. He wrote a number of bulletins on natural history as well as on events in the human history of the park. One of his articles, "The Wolverine and the Badger," was published in the *Sierra Club Bulletin* in 1930 (Vol. 15, No. 1). In that year there also appeared the results of his long study of the sequoias, written in collaboration with Col. John R. White, *Big Trees*, published by Stanford University Press. A revised edition was issued in 1938.

Walter Fry was born near Watseka, Illinois, March 14, 1859. The family moved to Kansas in 1868 and settled near Fredonia. There he grew up as a farmer, later working in the lead and zinc mines. He married Sarah A. Higgins in 1879. One of their four children, Clarence, born in 1882, has for many years been a ranger in Sequoia National Park. In 1887 Walter Fry brought his family to California and for the rest of his life lived near the Big Trees. His first acquaintance with them, however, was as a destroyer. While working for a lumber company near General Grant Grove he helped cut down a tree twenty-six feet in diameter. When he counted the rings and realized how long it had taken the tree to grow he refused to cut another and quit the job. He lived to see the fiftieth anniversary of the founding of the parks which were established to preserve the Big Trees. At the celebration of that event, held in Visalia, October 2, 1940, he was cheered again and again as "Dean of the Sequoias." On October 18, 1941, his long life came to a close.

Midway in the journey of his life, Walter Fry performed a feat of endurance that must take its place among the great deeds of the Sierra. It is set forth here in words which have been endorsed by the Judge himself: On August 31, 1906, he left Colony Mill on his six-year old mare "Maud," at

four A. M., and rode to Giant Forest—10 miles. From there he rode to the trail construction camp on Seven Mile Hill—10 miles; then, via Buck Canyon and Timber Gap, to Mineral King—18 miles. It was his intention to stop there, but he found no feed for his horse, so he went on to Atwell Mill and Lake Canyon. There he received word of a fire on the South Fork, so he rode to Three Rivers—30 miles. He continued to the scene of the fire—6 miles—arriving at 10:45 p. m. This made a continuous ride of 74 miles over the roughest kind of trails and with enormous changes of altitude. He spent the rest of the night fighting fire.

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IN MEMORY OF JEAN SCUPHAM

LOST AT LANDS END, JANUARY 15, 1942

Essential Music, mark this cliff!
A hearer to the heart of sound
Once in the wind above the choirng sea
Walked here, and fell from here, and is not found.

She heeded, for all the masters in her mind,
The humming child; wheel within wheel endured
Attentively the city,—lest there be
Even an accident of song unheard.

Honor of all mens' music had,
Body and mind, no temple lovelier.
Know what she loved alive, and know
This cliff a headstone suiting her.

MARIE DE L. WELCH

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Notes and Correspondence

Grazing in Recreational Areas

By DUNCAN McDUFFIE

The Committee on Grazing in Recreational Areas,* consisting of Richard Leonard, David Brower, Norman Livermore, Jr., and Duncan McDuffie, chairman, submits the following progress report. Unfortunately Mr. Livermore could not be present at the meeting of the Committee at which this report was adopted. In the preparation of this report we have had the benefit of the advice of Arthur Blake, chairman of the High Sierra Trails Committee, and E. Lowell Sumner, Regional Biologist of the Fish and Wild Life Service.

Mr. Sumner's "Special Report on Range Management and Wild Life Protection in Kings Canyon National Park," which was issued shortly after the appointment of the Committee, was placed at its disposal and has proved invaluable. It affords, in fact, the basis for this report. In addition we have had the benefit of an evening's discussion with Mr. Sumner at which the subject under study had the benefit of his experience, not only in Kings Canyon National Park, but in other western National Parks.

Mr. Sumner's report and the Committee's observation show that many meadows subject to pack-stock grazing are seriously deteriorating, and that some are almost past recovery. The most critical situation exists in meadows near heavily traveled trails, particularly in the lower areas of the park. In such meadows, as the result of over-grazing, breaking up of sod by grazing them too early in the season, replacement of forage grasses and sedges by weeds and the inroads of brush and trees, aggressive constructive steps designed to restore the forage should be taken at once.

If this is not done the forage value of the meadows will be completely destroyed and there will result a condition in the National Parks as serious as that of which we have complained in the National Forests. Naturally the application of remedies will result in some inconvenience to the users of the meadows but that is the price that has to be paid for misuse in the past.

Mr. Sumner presents an exhaustive study of the grazing problem in Kings Canyon National Park and offers definite proposals for preserving and restoring its meadows. With these recommendations your Committee is in agreement. Some of them should be applied in the more critical areas during the season of 1942. Accordingly we recommend the prompt application of the following measures by the Park Service:

1. Relocation of drift fences and of pasture bars so as to include larger meadow areas than are now enclosed by such fences and bars. An example is the heavily over-grazed Charlotte Lake meadow where a simple relocation of the drift fences would include a much larger grazing area which is not now used.
2. The placing of signs to instruct packers and those with their own stock about nearby available range areas. As an example the Paradise area,

*From report of the committee, submitted to the directors December 4, 1941.

which is heavily over-grazed, could be relieved by the use of meadows on Goat Mountain nearby.

3. The publication of maps showing the location of available meadows, particularly those not now in use.
4. Publication of instructions to packers and to parties traveling without packers regarding use and location of meadows in the neighborhood of trails and camping places.
5. Where the situation is particularly critical limiting use of meadows to one overnight stay of each party.
6. The employment of additional rangers and their assignment to strategic points from which they can control the use of the grazing in their respective districts.

In respect to the employment of additional rangers attention should be called to the obligation undertaken by the proponents of the transfer of Kings Canyon National Park from the Forest Service to the Park Service that better protection would be provided by the latter. Last year the lack of ranger supervision belied this undertaking.

7. The immediate establishment of trial plots to ascertain definitely the effects of the inroad of trees and brush upon the meadows.
8. Better administrative control of the pack stock of the trail crews and other park services.

No recommendation is made at this time with respect to cattle grazing in the National Parks. We are awaiting a study that has been made of this subject during the summer just passed.

The problem arising from grazing in the parks is just another phase of the eternal conflict between use and preservation which arises so frequently to plague the Park Service and Park Administrators.

The question may be asked whether the saturation point has not been reached in respect to recreational use of certain critical areas in the parks. It can at least be said with assurance that unless the present trend of meadow destruction is reversed there will be insufficient forage for any additional packing stock. With this in mind it is recommended that publicity of a kind that will increase the pressure on critical meadows should be discouraged.

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BRINGING BACK THE BEAVER

By HOWARD TWINING

Among the lasting impressions brought home by visitors to Glacier National Park are the sights of dams and houses of beavers along the streams beside the road. Those who hike the trails of the back country of the park are continually delighted by the sight of beaver workings along the mountain streams. Glacier is not unique in this. There are beavers in every state west of the

Rockies; in some of them trappers harvest beavers by the thousands each year.

Before the days of '49 California ranked as one of the important beaver-producing states. The Sacramento and San Joaquin rivers harbored countless beavers. One trapper and his party, in the winter of 1829, took 4000 beavers in the delta region and along the reedy shores of San Francisco Bay. The Hudson's Bay Company sent annual trapping expeditions to California and much of California was first explored by trappers looking for new beaver-trapping sites.

Beavers were originally native to the Colorado River, the Central Valley of California, and the northeastern corner of the state. For some unknown reason beavers in the Central Valley did not move up the courses of the mountain streams of the Sierra Nevada into the almost ideal aspen- and willow-bordered streams of the high country. They spurned the mountain streams of the Coast Ranges, and the colonies in northeastern California never existed any farther south than the tributaries of Honey Lake in southern Lassen County.

A survey of the beavers of California in 1940 showed that there are about 1500 beavers in the state, but it also disclosed that California streams potentially can support at least 25,000 beavers. This is a challenge, indeed, to the conservation departments responsible for the welfare of wild life in the state. There is scarcely a county so bereft of suitable streams that it cannot support a few beavers, but at the present time they occupy less than one-tenth of their potential range in the state.

In the summer of 1941 the California Division of Fish and Game, with the aid of the Wildlife Restoration (Pittman-Robertson) Act, initiated a program of beaver transplanting. The workers on this project take beavers from areas where they trouble farmers by damming his ditches or burrowing into his levees, and move them to mountain streams. They catch the beavers in large traps made of wire mesh, which hold the animals without injury. The traps are usually set in travelways; occasionally a scent attractive to beavers is spread where it will lure the animal across the trap. Beavers are very docile in captivity and are easily handled. They are held in a pen until enough are caught to make a plant (usually 5 or 6), and then are transported in metal cages to the planting site.

The requirements of beavers are not great. The stream in which they live must flow slowly, so their dams can form sizable pools, and there should be willows, aspens, or cottonwoods fringing the streams, for the bark of these trees forms their main food supply. They prefer to live in streams with high earthen banks into which they can burrow and construct their dens, but lacking these, they can build houses of sticks and mud.

A question frequently asked about a project such as this is: "What good will it do?" The answer in this case is easy. Beaver ponds slow the flow of rippled water. Large trout may seek the refuge of these ponds and trout food may be abundant in the still water. The dams hinder erosion by slowing the quick runoff from melting snow. The pools will hold water through the summer and may act to increase the flow of water, or even keep the stream from drying up entirely. Beaver pelts are worth 10 to 30 dollars to

trappers. The development of this resource may in the future provide an occupation for many trappers in the winter months. But the word "may" is used in describing these benefits, for little is known about these subjects and it is the purpose of this project to learn just what the beaver can do. We wish to be cautious before embarking on a wide-scale planting program.

So, some night if you hear the resounding splash of a beaver tail cracking the surface of the water in a mountain stream, wish him well; for he is probably the vanguard of a new addition to our mountain fauna, and one that will be an ever-present delight to mountain wanderers.

* * *

CLARENCE KING AND THE "ATLANTIC"

BY WILLIAM B. RICE

In his introduction to the latest (1935) edition of Clarence King's *Mountaineering in the Sierra Nevada*, Francis P. Farquhar has told in part the story of King's association with the *Atlantic Monthly*. The immediate result of this association was the publication during March-December, 1871, of eight articles dealing with the western mountains. With several additions these sketches were printed the next year in book form.

The editor of the *Atlantic Monthly* from 1861 to 1871 was James T. Fields, successor to James Russell Lowell and prominent author, publisher, and lecturer. One of Fields' editorial coups occurred during his last active months with the Boston magazine when he secured this series from Clarence King. Fields thus added King's name to a brilliant literary company, among whom were Bayard Taylor, John Fiske, William Dean Howells, Bret Harte, Henry James, and John Hay.

Two letters in the Henry E. Huntington Library, part of the Fields Collection there, add color to this part of Clarence King's literary career. They were written in March, 1871, after the *Atlantic* had printed one of his articles, "Active Glaciers within the United States," but before it began the series, *Mountaineering in the Sierra Nevada*. These letters depict King at work with pencil and paper instead of with map and geological pick; they contain a good-humored request for gentle criticism. The letters have been printed with the permission of the Huntington Library. Some minor punctuation has been supplied. Those who know their Clarence King will experience little difficulty in determining which chapters of *Mountaineering* he alludes to.

* * *

New Haven, Conn.
March 9th [1871]

My dear Mr. Fields

I send by express this evening a paper for your June Atlantic for which I think a good enough title is "Through the Forest." The article per se is not of so much interest perhaps as the one already in your hands but in connection with the two following ones will I think do. These two which I shall send you early next week are the Ascent and descent of Mount Tyndall and

will I am quite confident please you. I think with you that the best general title for the Atlantic series as well as title of book is "Mountaineering in the Sierra Nevada." I am rather at a loss in deciding about the fifth of the Atlantic series. My choice lies between an adventure with Mexican bandits in which I am pursued for days and escape in the night saved by the sagacity of my horse Ka-we-ah and an account of a day in the camp of a family of perpetual emigrants, an undescribed type of western people, a social deformity which impress you pathetically & drolly at once. Which? On the whole I will send both and ask you to make the choice.

In haste, faithfully yours,

CLARENCE KING

PO Box 108 New Haven, Conn.
March 24th [1871]

Dear Mr. Fields

I send by express to your address today four more chapters of "Mountaineering in the Sierra Nevada"; two about my remarkable trip to Mount Tyndall which should follow "Across the forest" now in your hands. As to Chapters 5. & 6. one or both should I think appear in the Atlantic. I suggest both as the chapters 7 & 8 I meditate will be different enough to give both of these point. 7. is to be an account of the great winter storm of 1864 which drove me out of the Sierras most dangerously. 8 will be a thrilling day among the crevasses and *sérac*, of an unnamed glacier. And now I am about to ask a very great favor; it is that when you have read these six papers you will kindly tell me what you honestly think of them and how you think I may better the rest of the series. I don't mean to ask much of your time for much may be said in a line,—as—hereafter I advise you to stick to geology—or—less local flavor, too much rubbing the plate with garlic spoils your salad—or some similarly mild form of admonition; it must be mild you know, else I promptly retire back into science. Joking aside, you have it in my power to say a word which may greatly benefit the book which you first suggested to me. As I am to take the field in one month from today it will be necessary for me to see this material in type; will you therefore send it to the printer as soon as convenient. I have not seen proof of the May article yet!

In haste, yours sincerely,

CLARENCE KING

MORE ABOUT CLARENCE KING AND THE "ATLANTIC"

BY FRANCIS P. FARQUHAR

Mr. Rice's contribution to the all-too-slender volume of literary memorabilia of Clarence King suggests the inclusion here of another letter on the same subject which by some chance has found lodgment far away from its companions in the Huntington Library. The letter referred to is in the collection of

Nathaniel L. Goodrich, Librarian of Dartmouth College and a member of the Appalachian Mountain Club. Through the courtesy of Mr. Goodrich this letter was reproduced in facsimile in No. 10 of *The Letters of Western Authors*, published by the Book Club of California in 1935.

Box 108 New Haven, Conn.
Feb. 24th, 1871.

My dear Mr. Fields

Having come to a business understanding with Mr. Osgood I send today by express to you the copy of my paper for the May Atlantic. It is made up altogether of new and unwritten things and will I hope please you. The June manuscript I will send in a week. Would it be possible to set up say five of the articles during April that I might read the proof before taking to high mountains in fact? Now as for a title for the Atlantic series it seems to me that this will be best.

SIERRA NEVADA PAPERS I THE RANGE (FOR MAY)

SIERRA NEVADA PAPERS II ACROSS THE FOREST (FOR JUNE)

SIERRA NEVADA PAPERS III THE CLIMB OF MT. TYNDALL

SIERRA NEVADA PAPERS IV DESCENT OF MT. TYNDALL

SIERRA NEVADA PAPERS V SUSAN

I do not at all like so unlocal a name as "High Mt. Papers" for the book. If as Mr. Osgood thinks the (to me quite harmless) word "Geological" would be too heavy ballast for my sketches I like next best Mountaineering in the Sierra Nevada put on the title page thus.

MOUNTAINEERING
in the
SIERRA NEVADA

I saw Bret Harte in New York & he told me of the plan of dining with you at the Saturday Club. If he enjoys it half as much as I did you will have conferred on him a great favor.

With kind regards to Mrs. Fields whom I hope not to miss seeing when I am next in Boston

Sincerely yours,

CLARENCE KING.

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SOME RECORDS OF MOUNTAIN SHEEP

BY ARTHUR H. BLAKE

The reports received by the Committee on Mountain Sheep during 1941 are few compared with those of 1940, but they are extremely interesting. All reports are filed with the various governmental authorities concerned with such matters. The report of Milton Hildebrand is of special interest because it is a

follow-up on a report by Norman Clyde and others from the same area, published in the 1941 magazine number of the *Sierra Club Bulletin*, and all corroboratory material is greatly appreciated. As Hildebrand's report is made by a student of zoölogy, it is quoted in full to show the layman who may make similar observations the type of information desired by the Committee.

Mount Tyndall vicinity (Inyo National Forest and Sequoia National Park).—On the afternoon of August 14, 1941, while Hildebrand and his party were climbing Peak 13,071, about a mile northeast of Mount Tyndall, they saw sheep tracks above the saddle. His report continues, "When we reached the point indicated, the ground was covered by the tracks. Droppings were frequent. Forms (bedding-down places) were very numerous. Needless to say I kept a sharp lookout for the sheep, and was rewarded at last when I saw a band of twelve to fifteen animals to the east. They dashed out of sight over a cliff to the north. I followed with my camera, but was unable to find them again. I could not make an exact count but would say there were at least twelve sheep. No estimate is made of the sex ratio; there were no lambs, but some of the sheep seemed only half grown, judging by size. Several were darker than the others. It was my guess, based upon single observation of sheep in the desert mountains, that these were young animals."

"The soil at this point is most favorable for sheep, being of sand and gravel. The animals cannot make forms in very rocky soils. They were at 13,000 feet and about 500 feet above standing water. Vegetation was scant, being mostly a form of alpine flowering plants I was unable to identify, and which showed no signs of having been eaten by the sheep."

Mount Williamson vicinity (Inyo National Forest).—Continuing Milton Hildebrand's report: "The following day (August 15) I saw further sheep signs, in soil like that described near Mount Tyndall, between the higher and lower summits of Mount Williamson, at 14,100 feet. Tracks, forms, and droppings were seen. Sheep have been reported seen on Mount Williamson before, but unless there is a record of sheep on Mount Whitney, this may be the highest altitude at which sheep have been reported in California."

San Jacinto area.—A large band of desert bighorn (*Ovis canadensis nelsoni*) was reported to M. Hall McAllister as seen on November 2, 1941, by Boy Scouts, climbing on ridges on Magnesium Mountain, who came onto a flock estimated at fifteen. The rams, ewes, and lambs made off soon after being observed.

South slope Mount San Antonio.—Henry K. Trobitz, of the Santa Ana Flood Control Survey, observed a band of about eighteen desert bighorn rams, ewes, and lambs near the 5000-foot elevation where they were browsing on grass and mountain mahogany. (From Report of M. Hall McAllister.)

Mountaineering Notes

CLIMBING IN THE BUGABOOS

I. THE SOUTH TOWER
BY JACK PIONTEK

We had traveled eighteen hundred miles to attempt the South Tower of Howser Spire, a virgin peak in the Bugaboos of British Columbia, which we considered America's number one climbing problem. Huddled around our tiny Everest model tent we shivered as the mountain's chill shadow leaned over our base camp. Then Jack Arnold's voice was ringing in our ears "Fritz! Look!" Fritz Lippmann, Ed Koskinen and I quickly looked up at the sheer face above us. Climbers! Impossible! Yet there they were, half way up the face, advancing to the top of the snow col. The day before at our base camp we had talked with a party of Seattle mountaineers, who had arrived one day ahead of us. We had told them of our intention to climb the South Tower of Howser, but they had been noncommittal regarding their plans, and we were quite unprepared to find them on the Tower ahead of us. The next day we spent in watching them. At four in the afternoon, they reached the top.

At dawn the next day we began our attempt, intending to follow their route. The morning was clear and soundless, only the crunch-crunch of our boots on the snow crust broke the silence as we climbed up to the bergschrund. This bergschrund had no snow bridge; instead we found a 20-foot overhanging lip which seemed ready to break off. Lippmann took the lead, wearing crampons and using the steps cut by the other party.

Just at the crest the balance was so critical he placed a piton. One of us found a fixed line running down from above so we assumed that the other party had roped down on it and cut it off. Using this for moral support Lippmann climbed over the lip onto the 60° ice slope. Advancing a hundred feet to the nearest rock he anchored to pitons, then brought us up. We were now one fourth of the way up the snow col, the top of which was the halfway point.

Lippmann now cut his way up another hundred feet of steep ice, then a three-hundred-foot chimney brought us to the crest of the snow col, the bivouac spot of the other party. It was late afternoon then but we decided to push on and bivouac high on the face. Traversing to the right, we climbed one pitch to the snowpatch, and glissaded over the snow to a rock in its center. This brought us to a wet friction pitch where Lippmann changed to rubber shoes, while the rest of us continued the climb in nails. Three more pitches brought us to a notch in the crest, our bivouac place. Pounding in pitons, we anchored ourselves and our rucksacks to the sheer face—an experience not easily forgotten. The sun vanished behind the ranges in an alpine sunset of indescribable beauty. The night was sleepless and cold for everyone, so that morning found us ready to finish our climb. One class-6 pitch and some easy scrambling brought us to the top, where we lingered for a while, then began the descent. Roping down to the col was easy enough,

but from the col to below the bergschrund required utmost skill to prevent rocks from falling on those below. This took much longer than it should have, but it was better that way. The last rope down over the bergschrund was fun. Each man dropped off the edge amid a shower of ice and snow blocks brushed off by the rope. From the bergschrund a quick glissade brought us to camp. We had been on the mountain thirty-six hours. It had not been a first ascent, but we had climbed our mountain and were happy.

II. HOWSER AND SNOWPATCH

BY EDWARD W. KOSKINEN

We retired early that night and slept late to make up for the sleep that we lost in the bivouac. The weather was bright and sunny as we gazed intently at the Main Tower of Howser, silhouetted against the deep blue sky. We were debating whether to get up early the next morning so as to be able to get onto the rock before the sun started playing upon the steep snowbanks and overhanging bergschrund that we had to climb. However, our minds were decided by the negative argument that if we climbed the Main Tower of Howser on the morrow, the good weather might change before we had a chance to climb Snowpatch.

So we broke camp and shouldered packs for the return to our high timber-line camp below Snowpatch. We attempted to descend the icefall between Pigeon and Snowpatch but the warm sun had melted the snow bridges and rendered the crevassed ice slope too treacherous for us, whereupon we went over to look down the Bugaboo-Snowpatch col, which we had climbed so laboriously a few days ago. Rocks of all sizes were to be seen incessantly rolling and bounding down the ice, rendering its descent an attempt at suicide. The shortest remaining route to our high camp was all the way around Pigeon Spire—a climb of almost a thousand feet on sunpitted snow; but as the rest of the way was almost all downhill, we decided to take it. We finished the climbing in an hour and started the long trek down the snowfields as the golden sun commenced to set behind the massive Howser Spires. We had to jump a number of crevasses, one requiring a leap of eight feet, with our packs on.

We finally arrived at our camp by moonlight at eleven o'clock and set about preparing a midnight dinner. Not having eaten for about nine hours we were a bit hungry. Just using one primus stove it took three hours for us to cook and eat the dinner, but when we hit the hay at two o'clock we had each consumed three Sierra Club cupfuls of lemon jello, four cupfuls of stew and two cupfuls of a "hot toddy" of powdered milk and a little sugar in water.

That night the four of us again slept in the Everest-type water-repellent tent with the waterproof floor. The characteristics of the tent were demonstrated to us during the night. It rained. With four crowded in the tent the water soon came in through the sides but couldn't get out through the floor. The next day we dried out our soggy sleeping bags by a bonfire and put up a waterproof neoprene tent.

This night, sleeping two to a tent, the little rain that we had did not bother

us. As the weather looked too gloomy for climbing we slept late and had a leisurely breakfast. During the morning the weather kept clearing, so much that at eleven o'clock we decided to attack Snowpatch at once. We threw our climbing gear together and in an hour had climbed up the talus and were roping up for the climb. To achieve the greatest speed we decided upon two ropes of two. Fritz led the first rope while Jack Piontek was first on the other one.

We climbed fast and methodically. We roared past Fritz Wiessner's overhang, the only place that we, like Raffi Bedayan and Jack Arnold in the first ascent in 1940, used direct aid. About the time that we reached the Vein Pitch it started to drizzle a little—just enough to make this pitch extremely interesting. It is a diagonal traverse along the small nobs of a quartz vein at a high angle, rather difficult in dry weather. A little beyond this pitch we diverted a bit from the Bedayan-Arnold route by continuing straight toward the right along a sloping crack rather than turning to the left. If some party endeavors to follow our route to the summit they should bear in mind that there is a 120-foot lead in it. Our 120-foot rope was short just about 10 feet, the amount necessary to tie around the waists and to the piton anchor. In order to make it, Fritz and I had to climb a few feet simultaneously, while I later tossed a rope loop down to Jack Piontek to anchor to while he belayed Jack Arnold, climbing 110 feet below.

The next pitch, an extremely delicate friction climb with no piton cracks to give the leader protection, brought us to the summit ridge. Our total climbing time to the summit was six hours. We took just enough time to sign the register for the second ascent, eat a little dried fruit and bar chocolate, take a few pictures and survey the numerous clouds in the sky. It was already a little past six p. m.

We hurriedly established an anchor for the 180-foot vertical rope-down from the summit ridge. Using our 120-foot climbing and 240-foot rappel ropes tied together we all descended to a chockstone in a right-angle chimney a little way above the Vein Pitch just as it got dark. As the rest of the route appeared to be right out in the open, we soon concluded that this two- by three-foot box seat would be our domicile for the long night coming up. Jack Piontek drove in three pitons to which we anchored all of our equipment as well as ourselves.

We took turns getting on the bottom of the pile of shivering humanity. It would be warmer on the bottom, but in a short while one would begin to feel cramped, and in addition our bed had a few rough spots. Eating is very helpful in a bivouac, so we ate intermittently throughout the night. We wore everything that we had, including knapsacks, into which we stuffed our feet. The maze of climbing and rappel ropes formed our none-too-soft mattress. Fortunately for us, after a few drops of rain in the early evening, the sky cleared, allowing the moon and stars to cover the expanse of glaciers and rugged rocks with an eerie light, while the rumbling, crashing, and crunching of avalanches could be heard all through the night.

With the first rays of the morning sun striking the bleak walls of Snowpatch we unfastened ourselves from the mountain and established a rope-

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down for resuming our descent. Quite an amount of rappeling was required to get us down; we kept using the 360 feet of climbing and rappel rope until near the bottom the two ropes were both the same length as a result of our cutting 120 feet of sling rope off the end of the rappel. We even roped down the Weissner overhang, running the rappel rope through carabiners in order to stay on the overhanging diagonal route.

Having conquered the two most difficult climbs of the region we ended the most enjoyable mountaineering vacation that we have ever taken. But we still remember clearly that Snowpatch bivouac. Perhaps there are those who will declare that there isn't room in a two- by three-foot area for four people to sit down very comfortably, let alone lie down. That's right; there wasn't.

HIGH TRIP MOUNTAINEERING—1941

By L. BRUCE MEYER

Variety was the spice of the 1941 High Trip. Instead of mushing in the higher elevations, we, the High Trippers, made our way into the kingdom of the rattlesnakes, leaving behind the high peaks of the Sierra Crest, biding our time on Rancheria Mountain, down, down, down we went, losing with each step what we hoped to find soon—elevation. Then someone found a trace of it in Rodgers Canyon, and the mountaineers enjoyed a brief respite among the peaks of Volunteer, Regulation, and Pettit, their first opportunity to uncoil the ropes. Owing to the lack of climbing possibilities, Polemonium Club sessions were frequent. In Pate Valley some enthusiasts used the sessions for a practical purpose in examining the Indian pictographs. In fact, the positions of some of these writings proved that the Indians were adept climbers. After much perspiration, and with hats adorned with numerous rattlesnake buttons in place of the solitary polemonium, we finally expanded on the snowbound shores of Tilden Lake.

The remaining two weeks left the mountaineers no excuse to become kitchen-groggy. Tower Peak offered the first challenge, and was quickly conquered by Norman Clyde and his stalwarts. In the distance, the Sawteeth cast their shadow in defiance over Matterhorn Canyon, and rock climbing became "interesting."

Lambert Dome.—As a limbering-up exercise, many parties made this ascent during the first two days in the meadows. Because of its prominence as a view point, a new box-type register was placed.

Regulation, West, Pettit, and Volunteer Peaks.—On the dates of July 4 and 5, twenty-nine climbers and would-be climbers signed the register for ascents on the above peaks. Those who traversed them were: Jerry Draper, Pat Goldsworthy, Jim Harkins, Harold Kirker, Dean Meyer, Leo Meyer, June Pierce, Graham Scott, H. B. Van Etten.

Snow Peak.—Howard Wurlitzer and Paul Ferrier made the climb on July 10 and reported an earlier ascent by John Dyer in 1938. Other ascents were led by Norman Clyde and Wayne Smith. Jim Harkins, and Blanche Stallings with Beatrice Ralston, made separate climbs. The peak is easily approached from Tilden Lake.

Tower Peak.—On July 11 and 13 Norman Clyde led parties of twelve members each. The first party had the privilege of placing a new box-type register on the summit. The most interesting ascent of this peak was made on July 15 by Raffi Bedayan and Barbara Norris, who traversed the south arête and climbed the west face. This was a class 4 climb and a very good one. On the summit fragments of arrowheads were found—further proof that Indians did some climbing themselves. On the 16th, Jim Harkins, Don Heyneman, and Al Gerould made the ascent. Dave Brower, Dorothy Markwad, Pat Goldsworthy, Ted Grubb, and Bruce Meyer climbed the west face and descended the southeast chute into Stubblefield Canyon on a cross-country trip to Kerrick Canyon.

Saurian Crest; Tower Peak, and Craig Peak.—A traverse of these three peaks was made on July 12 by Art Argiewicz and Howard Wurlitzer. They reported that it was a class 3 climb and that the Crest had been climbed in 1938 by John Dyer. On July 13, Miriam Simpson, Eleonore Ginno, and Caroline Coleman climbed only Saurian Crest, while Jim Harkins climbed the highest and southernmost point on July 14. Harkins also traversed from Snow Peak to Craig on the 12th and reported that there had been two earlier ascents.

Chittenden Peak.—A good view obtained for a short climb was the reason many parties made this ascent between July 12 and 16. A brass-tube register was placed on the 16th by Charlotte Mauk and Delta Woodfill.

Piute Mountain.—On a cross-country trip from Kerrick Canyon to Benson Lake, Art Argiewicz led the ascent of this mountain via the north chute. Those on the climb were Ted Simon, Nick Duff, Walter Marx, Les Toby, Fred Toby, and Ted Lerch.

Finger Peaks.—The east and west Finger Peaks were climbed on July 21 by Ted Simon and Nick Duff. On July 22, Jack Riegelhuth, leader, Bert Carlson, Paul Ferrier, Al Gerould, and Howard Wurlitzer made the ascent.

Matterhorn Peak.—The first of a number of parties to ascend the Matterhorn consisted of Fred Toby, Les Toby, and Virginia Kass. They placed a new box-type register on the summit on July 21. On July 22 Bob Thompson and Norman Clyde led mass ascents of the peak. Thirty-two climbers made the ascent. On the 23rd, nineteen more reached the summit under the leadership of Norman Clyde, Albert Marshall, and Eleonore Ginno. En route to Virginia Canyon, Ted Simon, Nick Duff, Wayne Smith, Nancy Jones, Elizabeth Rutan, and Walter Marx made the ascent on July 24 and continued via Spiller Canyon.

The Three Teeth.—Dick Leonard and Jim Harkins attempted the south-west face of the West Tooth on July 22. The route was class 5, but because of a difficult overhang, they were forced to abandon it. The same day Art Argiewicz, Bruce Meyer, and Jerry Draper attempted a new route up the west notch. They too turned back, and both parties joined forces to ascend the East Tooth via the regular route. A register was left on the arête leading to the summit. The next day Dave Brower, Bruce Meyer, and Art Argiewicz returned to the west notch and were successful. "Hannes" Brower demon-

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strated how the climb should have been made the day before. Jack Riegelhuth, Dorothy Markwad, and Paul Ferrier traversed the East and Middle Teeth and roped down the west notch chute.

Doghead and Quarry Peaks.—On July 22, Blanche Stallings, Katherine Kaye, Eleonore Ginno, Miriam Simpson, Caroline Coleman, Thelma Prichard, Mary Coxhead, Elizabeth Rutan, Dick Goldsmith, Carolyn Bender, Al Gerould, Walter Marx, and Marion Roach all made the ascent in four separate parties. On the 23rd Clifford Youngquist and Charlotte Youngquist made the ascent; also Al Gerould, Herbert Malcolm, Patricia Malcolm, and Walter Marx made the climb.

Whorl Mountain.—Ted Simon and Nick Duff climbed Whorl on the 23rd. On July 25 Jim Harkins, Delta Woodfill, and Ted Lerch climbed the peak on their way to Virginia Canyon via Spiller Canyon.

Peak 10,275.—Another cross-country party to Virginia Canyon consisted of Dick Goldsmith and Carolyn Bender. They climbed this peak en route.

Shepherd Crest.—On July 25 Pat Goldsworthy, Ted Simon, and Nick Duff went in quest of the Little Lost Valley of Shepherd Crest. This was the last ascent of the High Trip

A SKI ASCENT OF MOUNT WHITNEY

BY CLYDE V. NELSON, JR.

On Saturday morning, March 15, 1941, Chet Errett, Bill Rice, and I, strapped on our skis and shouldered our Bergans at the lower end of the frosty Whitney Portal campground. We broke a trail past Whitney Outpost in the sunny, windless weather that we were to enjoy for the rest of the trip. After arrival at the tarn just above Consultation Lake, we pitched our Robinson three-passenger tent and settled down to spend the night. Air mattresses and sleeping bags soon warmed us, and large doses of sugar and salt restored us.

Breakfast over, we left our limp tent at seven o'clock the next morning and pushed in zigzags through the snow toward Whitney Pass. Some old ski tracks in the vicinity perplexed us; we learned later that several others had preceded us to the pass but not much farther. We followed the trail toward Mount Whitney, removing our skis several times in order to obtain footing on the steep, hard coating of snow and ice. Skis were used, with these exceptions, all the way to the summit. Conditions were not entirely favorable; the strong winds common to mountain tops had eroded and removed most of the snow. A perusal of the register showed no previous ascents during the winter. On the return trip we abandoned a climbing rope at Whitney Pass, where it was noticed by two parties which visited the mountain during the next two weeks.

We left the sunlight at Whitney Pass and repacked our equipment in the shadow of the crest. Darkness caught us three miles from the road end; it soon imposed a weird technique, useful for tired, overburdened ski mountaineers descending in blackness through snow that varies illogically between icy crust and hip-deep powder. This new technique, named after one of the

members of the party, demands two processes: first, contour as far as possible on the skis; second, take off the skis, sit on them, and travel directly downhill. There are additional points which will occur to anyone; for example, the position of the poles, the use of the feet, and the repetition of the process. To our knowledge this technique has not been described previously in ski literature. On occasions which unhappily combine bad snow conditions, darkness, fatigue, and heavy packs, this downhill technique has some merit. It had in our descent. It soon brought us to the packed road, down which we slid rapidly to the car.

THE FOURTH ANNUAL KNAPSACK TRIP

BY ROBERT STEWART

On Sunday, July 26, twenty-four ambitious knapsackers, under the leadership of Art Fawkes, met at North Lake to begin what they thought was to be a summer trip through the High Sierra, but which rapidly developed into Arctic exploration of unexpected severity because of the snows and the high elevation of the route, much of it above 11,000 feet. The severity was compensated for, however, by the extraordinary beauty of the snowy Sierra and the unusually large display of wildflowers.

After a Sunday evening meal which included the commissary's first and last canned chicken, we were ready to start on Monday, July 28. Loads were distributed and packs weighed in. The girls (there were eight) carried packs weighing from 25 to 30 pounds, and the men started with from 35 to 45 pounds. The group moved to Upper Lamarck Lake over a trail passable for stock in normal years, and on Tuesday, the hardest day of the trip, climbed Lamarck Pass over steep hummocky snow, had lunch on the pass, and descended into Darwin Canyon over talus and more hummocky snow, to a camp just at timberline in Darwin Canyon. Here we remained until Thursday morning.

On Wednesday a large group led by Glen Warner made an unsuccessful attempt to climb Mount Darwin. A second and smaller group ascended an easy point (11,922) on the opposite side of Darwin Canyon, listed as, and apparently previously unclimbed. Art Fawkes and Ed Breitwieser spent the day in scouting the trail to Muir Pass, and reported hordes of mosquitoes at Evolution Lake, no trail in sight above Wanda Lake, and snow conditions generally bad. On Thursday morning, the first weekers, among them leader Art Fawkes, left for Muir Pass, dropping to Little Pete Meadow and climbing to Dusy Basin Friday, and returning to Bishop Saturday.

The second weekers, under the capable direction of Ted Lerch, made a short move up past beautiful, ice-filled Evolution Lake to a small lake just above Sapphire. This campsite was above the mosquito zone and was on the southernmost dry spot between Evolution Lake and Muir Pass. During the remainder of the day, Glen Warner and Kenneth Coates climbed Mount Spencer, and another small group climbed the ridge west of camp which, if followed, would have led directly to a climb of 12,279.

On Friday, August 1, a morning was spent in the climb over rock and snow, without benefit of trail, to Muir Pass. Muir hut was reached just after noon, and a delightful hour was spent in consuming quantities of snow sherbet. During the afternoon, Fritz Gerstacker, Barrett Coates, and Howard Wurllitzer climbed much-frequented Peak 13,223, north of the pass. That evening we learned the value of an ice-ax. We had to use one to chop enough of the hard snow to provide cooking water (wash water was not thought of). With a pleasant memory of a most delicious egg soup prepared by Fritz, we sat up half the night by the hut fireplace, drinking gallons of weak tea, while Kenneth and Barrett Coates led us in an endless number of songs.

After some argument, we elected to remain on Muir Pass another day for additional climbing, and also to lighten our loads by eating up some of the Muir hut food cache we would otherwise have to carry to the second cache at Little Pete Meadow. So, on Saturday, Kenneth and Barrett Coates, Fritz Gerstacker, and Jim Nance climbed Black Giant, while Ted Lerch and Mary Atkinson climbed Peak 13,223. Elizabeth Jossman, Edgar Frank, Robert and Marguerite Stewart attempted unsuccessfully to climb Mount Fiske by traversing about two-thirds the way up on the ridge between Peak 13,223 and Fiske. Then on Sunday, before breakfast, Sue Burgess and Glen Warner climbed the snowy Peak 13,012, southwest of Muir Pass. Perhaps it was on this occasion that Sue established undying fame for herself by breakfasting on raw oats, stirred up with melted cheese. The original itinerary called for us to proceed from Muir Pass down the east side of the Black Divide, eventually reaching the Middle Fork of the Kings River via Ladder Lake. After one look at the snow hummocks, we turned our eyes elsewhere and began talking about the beauty of green meadows and trees. By Monday we had moved down to Little Pete Meadow and the second food cache. The next day, Glen Warner and Sue Burgess climbed Langille Peak and followed the ridge west to the summit of Peak 12,114, listed as unclimbed; however, records on the summit indicated that this peak was climbed on August 19, 1907 by Geo. R. Davis and Geo. W. Hoop, topographers of the Mount Goddard quadrangle, and was also climbed in 1926. They then continued south and climbed Peak 12,566 by a class 3 route, the main north snow chute. This mountain was listed as unclimbed, and no cairn or record of previous ascent was found. They returned to the glacial cirque by an easier route, the northeast snow chute, and reached camp by flashlight at 8 p. m.

On this same day the main party went down to Grouse Meadow for lunch, and Barrett Coates climbed Peak 10,825, southwest of Giraud Peak. This day was also memorable for a feast which included forty-two golden trout contributed by the fishermen, Spanish noodles with wild onions, more of that remarkable egg soup, and butterscotch pudding (not, as it had been on an earlier attempt, butterscorch.)

On Wednesday, Kenneth Coates and Fritz demonstrated their good condition by making the circuit from Little Pete to Grouse Meadow, up Palisade Creek and into Palisade basin, thence over Knapsack Pass into Dusy Basin and back down to Little Pete Meadow, whereupon we had our first rain of

the trip. By Thursday the party began to break up, but not without agreeing that it might be a long time before we would again see such a sight as the eerie effect of moonlight on the immense snowfields at Muir Pass, or taste such a dish as Fritz's egg soup.

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RECORD CLIMBS OF MOUNT SHASTA

BY WM. BRIDGE COOKE

Something about Mount Shasta has inspired people to try to climb it quickly, a feat that is easy or hard, depending on the climber and his experience with mountains. If Shasta is a man's first climb, and he attempts it in the late summer after a dry winter, when most of the slopes are covered with loose lava talus and scree, it is arduous. If the climber has had wide experience, he finds the climb, whether in adverse conditions or over an ideal covering of extensive snowfields, comparatively easy.

The first stated record of time made in the ascent from timberline (approximately the site of Horse Camp) was that of John Muir in the old Sisson summit register, now in the Bancroft Library. This ascent, made in 1874, was accomplished in 4 hours and 10 minutes. Harry Babcock is the first person recognized to have made a record speed climb. In 1880 Babcock made the ascent in 3 hours and 40 minutes. His statement was corroborated by two persons. Norman Clyde is the second person to have been credited with a speed record. On two successive assaults on the peak Clyde made a record of 3 hours and 17 minutes on July 3, 1923, which was followed on July 5 by an ascent in 2 hours and 43 minutes. The first climb was corroborated by four persons, the second by another four persons and certified by a fifth.

Later in 1923 a local man, Barney McCoy, made the ascent of Shasta and claimed in the registers and in the local press a record time of 2 hours and 17 minutes. Officially, Barney had no witnesses, although in the *San Francisco Chronicle* story on August 21, 1923, three people were reported as having made the trip with him. However, I have no reason to doubt McCoy's word; moreover, he is well thought of by those who know him. Others, however, decided it was improbable for Barney to have made the speed he claimed. Among the others was the Sierra Club's Lodge Committee. The committee disallowed the record and drew up an elaborate statement giving reasons why such a climb in such record time was impossible under any conditions at any time of the year on any mountain. This drew local blood, and Barney was willing to bet \$100 that he could repeat. Thus was born the Mount Shasta Marathon.

Arrangements were made by the Lodge Committee of the Sierra Club under the banner of the Sierra Club, and by the Mount Shasta Chamber of Commerce, to promote a marathon on the mountain which would prove or disprove Barney's claims. Most of the local populace assumed the marathon would merely be a race between Barney and time. However, certain dark horses showed up, anxious to win the supposedly easy cash and trophy. Out of the large number who signed up for the race seven started. Of these, one was David Lawyer, of Pasadena.

Lawyer was 18 years old and had been toughened up by a number of weeks of experience in a near-by logging camp. The story goes the rounds that after the day's work at the camp near Castle Lake, Lawyer would run into town and back to camp—11 miles from Mount Shasta City up a rather steep narrow dirt road. Another story has it that Lawyer went to the Sierra Club Shasta Lodge at Horse Camp, start of the marathon, and climbed the mountain once a day for a week before the starting time. It is certain that Lawyer went to the summit at least once during that week, for he signed the summit register. It is possible that he got to Thumb Rock or to some other point once or more during that week.

McCoy took it for granted that the climb would be a "cinch," so he continued to work his gold mine until time to go to Horse Camp.

The climb itself appears to have been a rather dramatic event. The summit judges took a separate route so that the men would have to break their own trail. The climbers left Horse Camp in body but apparently soon spread out, as is true of most group climbs. McCoy was ahead on the snowfields, which that year were meager for the fifth of July. He had to kick holes into the crusted upper snow for footholds along the "island" below Thumb Rock. This tired him, and because he was hot and, strangely, did not perspire, he stopped to rest a few minutes. It has been said that Lawyer started in tennis shoes and changed along the trail to heavier shoes for the snows of the higher areas. This seems to be substantiated by photographs taken before and after the climb. Making use of the first man's footsteps, Lawyer passed McCoy where he was resting, possibly near Thumb Rock. Lawyer reached the summit in the record time of 2 hours and 24 minutes; McCoy was 13 minutes behind him. The third person to reach the summit did so more than an hour later.

Since 1924 no one has made a serious attempt to beat this record, although each year someone tries to make the climb as rapidly as he can. In 1940 James Beemer, of the University of California Forestry Summer School, made two trips to the summit, on the second coming within 7 minutes of the record established by Lawyer. No effort was made to prove this, those of the party and those on the mountain at the time taking Beemer at his word. And it should be remembered that few mountaineering feats can be officially witnessed by any disinterested person. To better McCoy's time of 2 hours and 17 minutes, a person would have to maintain an average speed exceeding 45 feet of elevation per minute from the 8000-foot climbing base to the 14,161-foot summit, four miles distant. Although an attempt at such a feat may be frowned upon as an exertion not necessary to the regular pursuits of life, still there are those who like marathons, as well as mountains. Who can tell what such a man might accomplish were he to train carefully, watch his diet, become thoroughly acclimatized, then choose the right route and season?

NEW ROUTE ON MOUNT WHITNEY

BY JOHN D. MENDENHALL

Seeking an unexplored wall of Mount Whitney, Ruth Mendenhall and I left East Face Lake on the morning of October 11, 1941, to attempt the impressive

Southeast Face, highest rampart of the peak. Knowing that the season was rather far advanced for serious work at fourteen thousand feet, we carried ample reserves of food, clothing, and climbing equipment.

The Southeast Face falls in great yellow cliffs to the couloir that separates the highest summit of Whitney from Keeler Needle. A short distance north of the couloir rises an overhanging chimney. The buttress between the couloir and the chimney looked quite feasible, and it seemed possible to traverse into the chimney above the overhangs, and work up the cliffs above. After cutting a few steps in the icy snow, we reached the buttress. The rocks above provided rapid and enjoyable class-four climbing; no pitons were required. The traverse into the chimney passed above the Scylla of the overhang and below the Charybdis of a bleak gendarme. The chimney at this point is over a thousand feet below the summit, but contains a few tins untidily dropped from above. The remainder of the route lay directly upward to the summit on pleasant rock that required two anchor pitons. A piercing wind made the summit rocks uninviting, and we did not tarry. On the descent, it was necessary to rappel down ice on the Mountaineers Route.

Many enjoyable variations are possible on the ascent, and the route is especially recommended if one proposes early- or late-season climbing, for the way lies in sunshine almost throughout; however, the route has obvious dangers in early spring climbing.

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YOSEMITE CLIMBING NOTES

BY DAVID R. BROWER

Although the past year's climbing in Yosemite Valley has been almost as extensive as ever, the records of climbs are sadly incomplete. Lt. Richard M. Leonard, who has previously compiled the records, is giving undivided attention to the army, as are several of the rock-climbers who have accomplished most of the climbing during the past two years. It is still, however, possible to give adequate descriptions of new climbs which were accomplished.

Three Brothers: Traverse.—Class 4. First ascent May 30, 1941, by David R. Brower and Morgan Harris. Having climbed the southwest arête of the Lower Brother four years previously, Brower and Harris felt entitled to start their traverse by way of Michael Ledge. They started just west of the notch between the two lower brothers, and traversed slightly upward diagonally to the right over class-4 rocks for about 50 feet, then climbed straight up over rock of the same difficulty for another pitch. Above, the face rose sharply in holdless cracks and block overhangs in a nasty sort of V gully, so they traversed horizontally to the left (west) a few feet around a little nose and slightly upward to a ledge. They tried to climb the face to the next ledge; it was extremely smooth and the holds were tiny, but they managed to get up about 15 feet to the next small ledge. Above was a bulging overhang, split by a crack with no place for pitons. Here Harris came up and stood on Brower's shoulders, then his head and hands, finally just getting over the bulge, whence he continued to a little alcove under a big block overhang. Brower led up this, a pitch with a delicate back-and-knee beginning; the top

looked impossible from below, but a couple of "thank-god" holds permitted a traverse to the right (east) just under the overhang and around the block. This placed them on the ridge. Above was 200 feet of easy scrambling, slightly exposed, on the west face of the Middle Brother. Next came a steeper break in the ridge, where they took the southeast side, directly over the big vertical face. The route was fairly easy, but was on unsound rock and quite exposed. Easy scrambling led to the indefinite summit of the Middle Brother. In the ascent from here to Eagle Peak, and in the subsequent descent to the Valley floor via Eagle Creek to the west, the rope could well have been replaced by a machete. (This account of the route comes from a description by Morgan Harris.)

Lost Brother (6625). Class 4. First ascent July 27, 1941, by David R. Brower and L. Bruce Meyer. Across the Valley from the Three Brothers, and well up the Taft Arête, which heads on the south rim just east of Taft Point, is a semi-isolated buttress for which the name "Lost Brother" is proposed. On May 31, 1941, Brower, Morgan Harris, and Ruben Schneider made the first known attempt on the arête.

The avalanche gully heading between Taft Arête and Taft Point fans out on the Valley floor about 400 yards below the old bear-feeding grounds. The best approach is to ascend the gully to a point in line with the Lower Cathedral Rock and the massive white-scarred overhang on the north face of the Lost Brother, and thence contour east to the base of the broad, sloping, brush- and tree-covered ledge under the white overhang; ascend this ledge to the highest point readily accessible at its eastern end. Here is the first roped pitch, which starts with a shoulder stand, and leads up a narrow crack to the top of a 30-foot block, almost completely detached, and partly overhanging the cliff dropping sheer to the eastern gully. From here ascend inside a narrow (very!) crack, proceed west 100 feet, and climb over easy pitches along the arête to the base of the overhang.

Here the party of the first attempt presumed they were stopped, paused for lunch, and commenced to retreat; but first, they decided, they would ascend to the highest accessible point on the face under the overhang. Three hours later Brower and Harris returned to the ledge on which they had left Schneider waiting while they tried "just one more pitch." Meanwhile they had ascended three narrow chimneys, two of these overhanging and one 60 feet high, had placed two pitons for safety, and had added some scrambling and an exposed traverse which took them high on a ledge leading around the east side of the summit mass. Here, at the base of a large Douglas fir, perhaps 600 feet below the top, they thought of the advancing hour and the waiting Schneider, and returned.

With much of the route now known, Brower and Meyer, both having been training a month on the High Trip, were able to reach the Douglas fir ledge quickly. Proceeding to its southern end they ascended into an alcove which provided an excellent belay position for the next 100-foot pitch. The route then led up and around the southern wall of the alcove and across good holds on an exposed face to the base of an open, waterworn chimney (class 5 when water is in chimney) heading on an easy ledge which continued to the notch

in the Taft Arête, just southeast of the Lost Brother summit. Here the two paused to enjoy the finest echoes yet discovered among Yosemite cliffs, then Meyer led the two class-4 pitches leading directly from the notch and over steep but broken rock to the broad summit. They descended from the notch into the east branch of the Taft gully, roping down the first 100 feet and scrambling down the remainder of the gully wall without using the rope. The "waterfall" just above the junction with the main gully was passed via a brush-covered shelf to the left (south).

The Rostrum (4500). Class 4. First ascent by Kenneth Adam, David R. Brower, Richard M. Leonard, Rolf Pundt, October 12, 1941. This is a detached platform on the south wall of the Merced Canyon $\frac{1}{4}$ miles west of Pulpit Rock, and is reached by descending Turtleback Dome from the Wawona Road, 1 mile west of the Tunnel. The party roped down from the canyon rim to the large granite blocks of the intervening notch, then climbed over small holds just to the right (northeast) of the notch and exposed to the 800-foot drop to the talus. Because a fall would end up either on this cliff or on the jagged blocks of the notch, one piton was used for safety, but the ascent is so short that it is hardly justifiable to place it in class 5 as a "severe" climb. The return from the notch to the rim is made by a series of rock-plant covered ledges to the right (southwest).

Lost Arrow attempts. The Lost Arrow route to the Valley rim was further explored, Fritz Lippmann, Robin Hansen, Raffi Bedayan, and others having, in several attempts, ascended some 60 feet above the First Error, and Brower and Pundt having climbed and roped down to within 30 feet horizontally of the Third Error, then demonstrating that the climb from that point back to the rim was possible.

Arrowhead Chimney (6800). Class 6. First ascent December 7, 1941, by Torcom Bedayan and Fritz Lippmann. Arrowhead Chimney is in the Castle Cliffs, midway between the Yosemite Point Couloir and Indian Canyon, and is a dark furrow in the face just west of and above The Arrowhead. The route to this spire is followed to the base of the Chimney. Here, one day last October, Lippmann, Henry Knoll, and Thomas Rixon started the first attempt. The quoted description that follows is Lippmann's:

"Tom led over the first tiny, class-4 chockstone. From the alcove thus attained he commenced pounding in five direct-aid pitons with slings, which brought him under the most unusual overhang that it has been our pleasure to surmount. A room-size chockstone has wedged between the perpendicular sides of the chimney, a chockstone that can be truthfully called underhanging, for the outer lip projects downward past the horizontal. The only way over is on the true right edge where the block touches the side wall. Tom placed an insecure ring in the crack between the two and retired for a rest. These last movements are made while the body is in a horizontal position. Next I tied into the double ropes and proceeded to haul myself up the 25 feet to Tom's previous position, which looked far worse than it had from below. The direct-aid ring was indeed loose. I hammered it some more, hampered by the lack of space to hit the piton. I decided to advance on it anyway, and cautioned Henry to be ready for a fall. With the aid of two slings I swung my-

self up into the vertical, holdless chimney. Wedging myself higher, I managed to reach some good holds and utilized them while I still had the strength. The other two followed at once, Henry removing the pitons—all but the last ring, which I backed down to and removed by pulling it out with my fingers. Two class-4 pitches, one requiring a tight squeeze behind another chockstone, brought us to the fourth and final chockstone of the series. It looked ferocious indeed. I commenced pounding in pitons on the true left wall of the chimney under the chockstone. I managed to get in three pitons which actually had no right to be there, so poor were the cracks for pitons. I could find no more places, so retired in favor of Tom. He did a magnificent job in getting in two more pitons, which brought him over the overhang. Easy scrambling brought us to our high point, a tremendous chockstone that none of us liked. Each side of the chimney was of very high angle, and apparent routes around ended nowhere. Using two ropes, we roped down the 200 feet of the chockstone series in one jump."

A second attempt was made in October, with Lippmann, Knoll, and Torcom Bedayan participating, but was stopped in the same place. On this attempt, as may be seen in Lippmann's description, the party had difficulty with the bottom chockstone. Knoll placed the five direct-aid pitons, then belayed Lippmann:

"I endeavored to proceed on a shorter ring piton than we should have used. There was a loud ping, I fell away from the rock, and found myself dangling in midair, eight feet lower down. I quickly swung in to my last piton, banged in the ring again, and tried once more. After much struggling with long step slings I managed to grasp the good holds above the chockstone, but had no strength to pull up with. So down I slid again, this time to the bottom. Torcom took over, but he was frustrated by the excessively long slings. He too reached the good holds, but had no strength left. I tried again and fell from the top holds. Torcom took over, arranged the slings properly, and swept over the barrier. Henry, then I, followed, but the pitons were left in, for I had no strength to remove them."

Now more than ever fascinated by the unknown difficulties that lay ahead, Lippmann and Torcom Bedayan joined in a third attempt, the account of which emphasizes the severity of the climb. Starting early on December 7, having difficulty with a kinked rope at the lower chockstone, pulling a direct-aid piton out with fingers higher on the route, the pair finally came up under the final, tremendous chockstone.

"Time was growing short. We decided that if we were to complete the ascent we must find a way around that last chockstone. I took the hardware and started on a suicide route on the true right wall about 300 feet below the chockstone. If our route would go, we could rise 100 feet and traverse to the top of the chockstone. It didn't look good. I pounded in four poor direct-aid pitons. The angle was terrifically high for the unsound rock, holds, and pitons. I got in four more after many minutes of hard, intensive work. Torcom seemed far below me. The wall dropped unrelentingly right to his feet. The pull-over onto a tiny, outward-sloping shelf will remain as one of the toughest I have done.

"From a direct-aid ring which had slid downward and wedged itself as I put my weight on it, I lifted and put my left foot in a high-angle trough slippery with leaves, twisted it, using hands for balance, lifted my right foot from the sling, placed it on a tiny protuberance far to the right, and rose upward to some small claw holds, which were all that held me while I shifted my left foot higher. I was mentally and physically exhausted, but I stayed there. Anchoring myself in position with a piton, I brought Torcom up.

"The next pitch to the top of the chockstone was another horror pitch—a 100-foot lead without piton protection on delicate friction, quite a bit of which was wet and lichenized. The angle was such that at the time I figured retreat was next to impossible. But the route was there, so out I went, but ever so cautiously. A bend of rock hid me from my belayer. Ever upward and outward I proceeded, the safety of the scree above the chockstone, so far away at first, appearing ever closer. The last pitch was wet and most difficult, requiring great care. I breathed a great sigh of relief as I anchored into the nearest tree I came to and yelled triumphantly for Torcom to climb. He came daintily around the bend, where he looked so, so far away, down in the depths of the chimney. He cautiously reached my position, then we immediately started the 1500 feet of talus and unroped rock-climbing that remained, pushing to the limit to reach the top before darkness completely enveloped us. Finally we were trudging through icy snow over to the Yosemite Falls trail, which would take us down into the Valley and our friends in safety."

Lippmann, now in the Air Corps, has made many fine climbs in Yosemite and the Bugaboos. He and enthusiastic companions of his own age, many of whom are also now in the armed forces, have invented some hair-raising, direct-aid climbs on local rocks, and have perfected their piton technique in so doing. Having perfected the technique, they naturally should wish to use it on some spectacular Yosemite route. But the aging climbers among us—those nearly or over thirty—cannot help but wish that, with their technique, they had carried with them the mental factor of safety that Richard M. Leonard, who organized their rock-climbing section, has taken with him. Should he ever fall, Leonard has claimed, his first thought would be, "What will Underhill say of my technique?"

Other climbs.—On the Memorial Day week end, 1941, Leaning Chimney was climbed the second time by Robert K. Brinton, Chappel Crammer, Clyde V. Nelson, Jr., and William Shand. Third ascent of the northwest face of Lower Cathedral Rock was made by Brinton, Nelson, Chester L. Errett, and Glen Dawson. With Shand, Raffi Bedayan made his fourth ascent of the Higher Spire. On September 26, 27, and 28, 1941, Shand and Dave Lind climbed the Lower Spire, Pulpit Rock, and the east face of Glacier Point.

"HALF A LOAF . . ."

BY ART ARCHEWICKS

If moderation is the keynote of mountaineering the members of the 1941 Base Camp need not hang their collective head in shame. A moderate number of

peaks were climbed and these, for the most part, were of "moderate" difficulty. Snow conditions of an unusual nature were shared with most of the Sierra outings. Although the white expanses were blistering and arduous during the ascent, they became glistening highways of delight to the carefree, but not too unwary, glissader.

Garnet Lake affords a spectacular view of the Ritter-Banner massif. It is no surprise, then, that Banner Peak should be the first to succumb to the attack of ambitious base campers. After a few preliminary brushes, consisting of an unsuccessful attempt on the summit and a highly successful trip of exploration and measurement on an unmapped glacier under the north wall of Banner, the summit yielded to the mass tactics of 31 persons led by Oliver Kehrlein. An inspection was also made of a small hanging glacier situated north of the northwest arête of Banner. A small party, under the leadership of Lorin Trubschenk, climbed to the summit by way of the saddle and north-east face.

Forsaking the luxuries of Base Camp for the hospitality of Ruth and William Albee, Lorin Trubschenk, George Wilkins, and Art Argiewicz enjoyed a day of climbing under the leadership of Jules Eichorn. An ascent of Eichorn Minaret was accomplished.

Mount Ritter yielded its second ascent of the season to Cope Palmer, Barbara Saunders, and Don Heryford, who climbed the northeast glacier route on August 7. On the following day Lorin Trubschenk and Art Argiewicz climbed Ritter by what they consider a new route. The ascent was forced directly up the buttress east of the prominent snow ledge on the north face as seen from Garnet Lake. This buttress rises from the cirque enclosed by Ritter and Banner 2000 feet to the summit ridge. Pleasant third class climbing on firm, angular rock was enjoyed despite debris encountered on the ledges.

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DESERT PEAKS SECTION

BY CHESTER VERSTEEG

The Executive Committee of the Southern California Chapter has authorized the creation of an honorary climbing section (no dues, no officers, no meetings) to be known as the DESERT PEAKS SECTION, membership in which is attained by the ascent of the following seven eastern California desert peaks, two of which, Waucoba Mountain and New York Butte, require the backpacking of a 24-hour water supply; all are best climbed during spring and autumn; on four, winter ski climbs can be made, if the snow be taken at "high tide." The peaks are:

White Mountain Peak (14,242). Highest summit in the White Mountains, northeast of Bishop (White Mountain Peak quadrangle).

Waucoba Mountain (11,127). Highest peak in the Inyo Range, southeast of Big Pine (Bishop Quadrangle).

Telescope Peak (11,045). Highest peak of the Panamints, overlooking Death Valley (Ballarat quadrangle).

Maturango Peak (8850). Highest peak in the Argus Range, south of Darwin (Ballarat quadrangle).

Coso Peak (8156). Highest peak in the Coso Mountains, southwest of Darwin (Ballarat quadrangle).

New York Butte (10,620). In the Inyo Range immediately east of Lone Pine (Ballarat quadrangle).

Cerro Gordo (9217). In the Inyo Range, east of Keeler (Ballarat quadrangle).

It is expected that by autumn at least a dozen members will have qualified for membership in this section, several having already made three or more of the climbs. After a scouting trip on New York Butte by Virgil Sisson and Chester Versteeg (accompanied by Larry Jeffries) the first official outing to attain membership in this section was made to New York Butte on November 15-16, under leadership of Niles Werner. The following members made the climb successfully: Braeme Gigas, Harry Paley, Pat Carmical, Katherine Smith, Freda Walbrecht, Bill Crookston, Carl Durrell, James Tow, Harry Greenhood, Niles Werner.

All of the peaks of the Desert Peaks Section present marvelous desert panoramas; White Mountain Peak and New York Butte present as fine views of the High Sierra as can be found. Maps and complete data including routes, classes of climbs, best climbing season, etc., are on file at the southern California Sierra Club rooms, Philharmonic Auditorium Building, Los Angeles.

Book Reviews

Ski Mountaineering¹ Skiing in the United States shows signs of coming of age. First a daredevil sport, later a social necessity with the sequitur of its becoming an exploited fad for the multitude, skiing has at last achieved the distinction of a skill in which every outdoor person trains himself as a matter of course. The ski tow has served its purpose well. The better ski instructors have trained legions of enthusiasts in the fundamentals. Inevitably, the crowded slopes have palled and an ever-increasing number of skiers have sought the peace, the freedom, and the exhilaration of ski touring in the mountains. With the coming of war and the inclusion of Mountain Troops in the Army of the United States for the first time, ski mountaineering has assumed vital significance.

The literature of skiing is a generous one, adequately covering the fields of instruction, history, and gadgets—but ski touring has been sadly neglected. At last a book has been produced which starts to fill this gap. The *Manual of Ski Mountaineering*, edited by David R. Brower, and with contributions by Brower, Alex, Joel and Milton Hildebrand, Dr. H. Stewart Kimball, Murray Kirkwood, Richard M. Leonard, Einar Nilsson, and Bestor Robinson (all Sierra Club members), is a welcome pioneer. Intended as a syllabus rather than as a definitive work, in order that the book may be conveniently carried in pocket or pack, it has compressed into 136 pages much of the basic knowledge necessary for anyone to have before undertaking ski touring in the mountains. It calls for nice judgment to decide how much knowledge may be presupposed on the one hand and into what advanced sphere it is wise to lead the novice on the other. No two authorities, or groups of authorities, would ever agree on the exact material which lies between. Most, I believe, would agree that the scope of this book has met the problem with obvious thought and reasonableness, and with a new and direct approach. The reader is presupposed to be a competent skier, to have taken at least the Standard Course in First Aid, and to be familiar with summer camping. At this point the *Manual* initiates him into what he must know when his skis take him beyond the reach—and help—of civilization. While the book deals with skiing in the mountains, it categorically eliminates from its scope travel on glaciated or rock covered terrain, and modestly defines its purpose as instruction to the novice. However, the more experienced will find much that they can read with benefit particularly as most of this book is documented field experience rather than the too customary rehash of existing authorities. The title is taken from the splendid and preexisting test of the same name. Both the test and the *Manual* would be judged more fairly were *Ski-Touring* substituted for *Ski-Mountaineering*. Any one of several of its chapters would fully justify its publication.

"Warmth" makes a valuable contribution in providing the physiological

¹*Manual of Ski Mountaineering*. David R. Brower (ed.). University of California Press, Berkeley. 1942. xvi-1-136 pp., frontis., 14 figs. in text. Price, \$1.50.

[Space limits have necessitated the elimination from this review of detailed comment and comparative data. Ed.].

reasons for what follows. The mechanics of the body when reacting to cold are not generally known.

"Equipment" covers this controversial subject admirably, listing and describing in detail necessary and optional items. As no two people agree about equipment, I shall limit my comments to a condemnation of the sectional tent and an unchanged belief in the foolproof advantages of the candle lantern over the flashlight.

"Wax and Skins" gives the necessary waxing information except for "stick-on" skins, about which rather more could be said. Also, the statement "Fair climbing ability is sometimes achieved by a thick coating of wax, coated in turn with paraffin" is one which I should question.

"Water" covers an important subject but does not come up to the standard of the rest of the book. The consumption of too much water is far worse than too little. The suggested use of a waterproof cloth in which to melt snow for drinking water should contain a caution about the possibility of a poisonous or unpleasant chemical from the fabric being dissolved in the water. The taking of additional salt, at times desirable or necessary, has assumed the proportions of a fad, frequently with harmful effects. The eating of snow and the drinking of too cold water I consider injurious.

"Food and Cooking" is a super chapter containing a most unusual amount of valuable information per man page.

Likewise, "The Technique of Travel" compresses into a short space the fundamentals of the subject within the scope of ski touring and includes much of importance that the experienced too often neglect, going, as it does, well beyond the obvious. While agreeing that a touring party "will usually get along best as a democracy," I feel that it is vital that a leader be chosen *at the start* so that in an emergency the rest of the party are prepared to follow his directions instantly. To this chapter's many precepts I should like to add one—that *all* members of the party glance back occasionally and make a conscious effort to memorize any route over which the party plans to return.

"Selecting a Campsite," "Shelter," and "Miscellaneous Notes on Camping" each likewise admirably compresses a wealth of information on its subject—not neglecting the value of scenery, which has been known to be overlooked.

"Snowcraft and Avalanches" is a comprehensive subject to cover in 20 pages. Unless one were to write a volume—and it would be difficult to improve on Seligman—there is little to be added to this excellent syllabus.

"Compass and Map" in ten pages is more complete and understandable than many courses on the subject.

"First Aid" is really "second aid" as applied to certain of the accidents for which preparation must be made. While much useful information is included, the chapter is either too long or too short and may lead the unwary into difficulties. The best part of it is the diagram of taping an ankle. The worst is the unqualified statement that stimulants should be given following an accident. Common sense cannot be taken for granted.

"Transportation of the Injured" follows standard practice. The final chapter is "The Ski-Mountaineering Test" for which this book forms the manual.

The Appendix is a check list of equipment with weights. The suggested reduction of weight is admirable but the items omitted—change of clothing in the event of wet, and placing under *optional* of rope—limit the ski touring to ideal conditions. The brief Bibliography covers the field adequately. Two titles which could be added to it to the best advantage would be *The Friendly Arctic* by Vilhjalmur Stefansson and *Hints to Travellers* issued by the Royal Geographical Society.

The ski mountaineer who would explore mountains under heavy glaciation must know and the ski tourer might well learn how to cross glaciers, to test and use snow bridges, how to extricate himself and others from crevasses, the Prusik loop, the fundamental uses of the ice ax, how to belay, cut steps, and undertake roped skiing. Chapters covering this field are needed and would go far toward making this book fulfill its title. A brief chapter on the elements of mountain weather and the use of the simpler instruments would be an important addition. Two pages devoted to miniature high-altitude photography, while certainly not a necessity, would increase the *Manual's* value as a *vade mecum*. Judged by its obvious intent and purpose, it is an excellent volume, commendably concise and well written in a straightforward manner free from dryness. It is well printed with pleasing format in a flexible waterproof binding, pocket size. Its faults can easily be eliminated in succeeding editions and have the merit of promoting healthy and constructive discussion. This *Manual* should find a welcome place in every skier's library or pack (8 oz.).

PHILIP DANA ORCUTT.

MODERN MANUAL. The need of a manual of mountaineering technique directed especially to the conditions prevalent in this hemisphere has long been recognized by American climbers.²

All attempts by British, French, German, and other European writers on the subject to produce works of universal application have inevitably ended in expressing a limited point of view. Geoffrey Winthrop Young's precepts in *Mountain Craft*, and the discussions of rock-climbing and snow and ice technique in several other standard works are of fundamental value and should be studied by every climber who aspires to competence, especially in leadership. But the trouble with these works is that their authors or publishers have not been content to make them general, but have introduced chapters of application to specific fields, and in no book is the field of American Mountaineering specifically included. There naturally devolved upon the American Alpine Club, therefore, the task of instituting a climber's manual designed especially for use in this hemisphere by American mountaineers. Plans for publication of such a work were accelerated by recognition by the Army of the importance of training troops in the most up-to-date methods of traversing mountain country. Consequently, a preliminary edition of a work already well in hand was rushed through the press in the

²*The American Alpine Club's Handbook of American Mountaineering*. By Kenneth A. Henderson. Houghton Mifflin Company, Boston. 1942. 239 pages, illustrations from drawings (149 figures). Price, \$2.75.

summer of 1941 and was circulated to a limited extent among members of the American Alpine Club and others well qualified to suggest corrections and additions.* The result is the present *Handbook of American Mountaineering*. Although the sponsorship of the American Alpine Club is implied by use of the club's name on the title page, the stages of the book's production are not made clear in the preface, and one is left in doubt about whether this is a private enterprise or an official publication of the club.

No time is lost by the editor in getting into stride. The book opens with chapters on Rock Terrain and Ice and Snow Terrain, followed by Dangers and Rescues. Thus, in the first third of the book are covered the fundamental practices in which every climber, especially the leader, should be proficient, whether his fortunes take him to the Alps or the Andes, the Caucasus or the Rockies, whether to Alaska or to Tibet. There follow a dozen chapters covering a variety of subjects without much attempt at arrangement but with a high sum total of value. Camping and Cooking are rather briefly considered, but contain points of special importance to mountaineers. The chapter on Equipment will doubtless provoke more heated discussion than any other, for personal predilections reach their peak in this province. Here, too, one is most likely to find the pitfalls of limited geographical experience. I could name a few, but I'll leave them for those who like to make an issue of these matters.

Personal Hygiene, Map Reading and Use of the Compass, and Mountain Weather seem to go together very well under the unexpressed heading of Science and as such are over my head. Sledging, Horse Packing, and Use of the Airplane, are, I believe, here introduced for the first time in a manual of mountaineering and are a welcome substitute for discussions of Huts, Porters, and the Native Races. The chapter on Photography is well directed at mountain practices and is free from highly obsolescent detail. Communications is rather the reverse, but is brief. The "Miscellaneous" chapter might well have been more miscellaneous; it covers only the determination of altitudes by barometer and kindred instruments, a few words on angles and visibility, and two very useful tables—meters and feet, and kilometers and miles.

There is a final chapter on the Mountains of the Western Hemisphere, which is quite a large order. I doubt whether it really belongs in a handbook of this character, but since it is here we might as well accept it and be thankful, for it is the best list of the sort that I have seen and the bibliography is very helpful. Nevertheless, I should like to see substituted in the next edition a series of brief notes by mountaineers particularly well qualified to speak for their respective districts, covering the salient peculiarities and problems of the varied ranges herein mentioned. That there will be a next edition, and many of them, I feel quite sure, for Kenneth Henderson has set up an enduring framework which will not easily be superseded, although many others will doubtless, in time, strengthen it and replace worn parts with new ones. To him and to his assistants in this enterprise the thanks of American mountaineers are due.

FRANCIS P. FARQUEHAR

**Manual of American Mountaineering*. Edited by Kenneth A. Henderson. 179 pages. Accompanied by separate volume of sketches by Virginia Lee Burton, 92 pages (152 figures). American Alpine Club, New York. 1941. (Not for sale, out of print.)

YOSEMITE
FOR CHILDREN³ The beauty of Yosemite Valley, caught by Ansel Adams's sympathetic lens is familiar to all members of the Sierra Club, and here we have added to that beauty some of the more lively aspects as seen through the activities of the two children, Michael and Anne.

The book is made up of a series of these fine pictures, carrying the children through a happy day in the valley. The sequence is maintained by Virginia Adams's simple but charming text, which links the photographs into a story. Perhaps it is a somewhat ordinary day for those children living there, but no day could be entirely ordinary to the child reading this book, that brings deer to the doorway, birds to the windows, and great waterfalls pouring over the cliffs near by. To have a river flowing close would be enough to make a paradise for any child; but to add to that, bears, bluejays, a new little colt, a baby burro, and rides on Uncle Don's horse, is indeed heaven on earth. Picnicking, bathing, pounding acorns in an ancient mortar hole for an old Indian friend, and finally racing a thunderstorm home, should finish a perfect day. But although it leaves them in bed, it leaves them with the vision before them of a future summer happiness, of camping with daddy in the High Sierra. And it leaves the reader, child or adult, with an enhanced vision of that beautiful part of California; subtly it teaches something that perhaps he did not know before about the fascinations of nature, and the value of beauty in any form.

H. T. P.

HIGH CONQUEST⁴ The Story of Mountaineering has been told many times and in many different ways, but it will always bear retelling from a fresh point of view. Now, a fresh point of view is almost a certain occurrence every few years, for the story is one of a continuing event and the word "finis" will not be written for a long time, if at all. But there is a new point of view obtainable horizontally as well as vertically, and Mr. Ullman has availed himself of an observation post that has long been waiting for an observer, one from which the Alps are viewed from across the Atlantic Ocean instead of from across the English Channel.

To those who are not already familiar with the oft-told tales of Mont Blanc and the Matterhorn, Mr. Ullman's narratives will provide an adequate introduction. Others, more familiar with the record, will perhaps take issue with his uncritical acceptance of Whymper's preëminence. One finds this attitude elsewhere in the book, as, for instance, in featuring Stuck rather than Karsten on Mount McKinley, and in giving John Muir a little more than his due in saying that "The Sierras were first thoroughly explored and made known to Americans" by him. Notwithstanding this uncritical attitude, Mr. Ullman has shown an unusual amount of originality in bringing forward many great

³*Michael and Anne in the Yosemite Valley.* By Virginia and Ansel Adams. The Studio Publications Inc., New York, London. 1941. 64 pp., 60 half-tone illustrations. Price, \$1.50.

⁴*High Conquest. The Story of Mountaineering.* By James Ramsey Ullman. J. B. Lippincott Company, Philadelphia and New York. 1941. 327 pages, illustrations. Price, \$3.75.

events in mountaineering history that have hitherto been neglected. The mountains of Africa and the Andes of South America appear in good perspective, and the recent as well as the earlier ascents of North America's greatest mountains are duly chronicled. The reading list at the end of this volume is excellent, and the list of One Hundred Famous Mountains shows far greater discrimination than is usually found in such compendiums. The note on Volcanoes may be accepted as a concession to the author's own fancy. The illustrations are well chosen and well reproduced. They convey admirably the sense of spaciousness and grandeur that dominates the whole book.

FRANCIS P. FARQUHAR

MOUNTAIN REMINISCENCES⁸ This is an autobiography of the private life of the author, a life entirely separate from his public life. In the latter he was a politician, an administrator, and a writer. In this private life he was mountaineer and traveler. His traveling takes him from his early childhood in India, to his youthful adventures in the Near East and the Alps, to South Africa, and in later years he covers a large part of Canada and the New World. Wherever he went it was with a zest for the adventure at hand, and the familiar longing to climb all the mountains he encountered on the way. He managed to climb many successfully, and to have a great deal of fun in some of the unsuccessful attempts. It is interesting to read these reminiscences of an earlier day, before the Great War; and part of the reader's enjoyment is because the author is so obviously enjoying himself while he is reminiscing.

H. T. P.

HISTORY OF A MOUNTAIN SCENE⁹ First calling attention to one of geology's most significant lessons, that "all landscapes are evanescent," volcanist Howel Williams gives, in Part I of an attractive little book, a graphic word-motion-picture of what has been happening for the last seventy-five million years to a particular landscape now famed for its inspiring beauty—Crater Lake. In Part II the evidence upon which his story is built is presented interestingly, in nontechnical language, in the form of a discussion. Appropriate illustrations, charts and maps add interest and will aid geological detectives who wish to figure out for themselves "what happened here." The book is a readable presentation of this famous geological question; an excellent introduction not only to Crater Lake but to National Parks and to geology.

B. S.

⁸*Days of Fresh Air.* By L. S. Amery. Jarrolds, London. 1939. 320 pp., illustrated. £5s.

⁹*Crater Lake. The Story of Its Origin.* By Howel Williams. University of California Press, Berkeley. 1941. xii+97 pages, illustrations. Price, \$1.75.

CRATER LAKE¹ Poet-writer Wayland A. Dunham first turns to verse and presents, in appropriate form, "La-O-Yaino, The Indian Legend of Crater Lake." Then, writing in prose, he becomes an enthusiastic guide, taking us to a point in mid-air from which to witness, in imagination, the geological activity that created the setting for the "Blue Enchantment" of Crater Lake.

When we come down to earth again, we "sky-ride the Rim," visiting all the points of interest along the way.

The book includes illustrations and a useful "Glossary of Brief Facts."

B. S.

DEATH VALLEY² It is a Paiute saying, according to Mary Austin, that no man should go far in the desert unless he can find shelter from the sun in the shade of his feathered arrows. Margaret Long did not rely on arrows alone. *The Shadow of the Arrow* begins with her story of a somewhat adventurous automobile trip into Death Valley from Beatty, Nevada, in 1921. There are accounts, enriched by quotations from diaries, of adventures of the pioneer parties, an interesting story of the Borax industry, and the log of a 1940 trip over the trail of the Forty-niners, from Salt Lake City to Los Angeles by way of Death Valley. The author has made many trips to the desert, and her experiences over two decades furnish material for her book. One is tempted to conclude that it, to some extent, is just a repetition of what has already been written about the geology, botany, zoölogy, lost mines, and missing men of Death Valley. The many photographs unfortunately do little justice to the scenic appeal of the valley.

JAMES H. BARBOUR

WILD LIFE IN MIDWINTER³ Coyotes as amusing and engrossing (but still wild) pets, coyotes as beloved friends, coyotes as vivid and distinct personalities—these are the pictures that linger above all others when one has read this interesting and delightful book. Unbelievable to everyone who hears of it, unbelievable, at first, to those reading it, the story becomes convincing because of the genuine and simple way in which it is told. It is happily free from that sentimentality too often found in accounts of human relationships with animals.

Nine snowy winters the Lofbergs spent in charge of a high mountain station where an immense dam was under construction. The nearest town, Big Creek, could be reached only on snowshoes. At Florence Lake, 7300 feet elevation, they enticed birds and animals to their feeding grounds. Here Mrs. Lofberg figured out her own way of keeping the balance of nature, luring

¹*Blue Enchantment. The Story of Crater Lake.* By Wayland A. Dunham. The Caxton Printers, Ltd., Caldwell, Idaho. 1942. 109 pages, illustrations. Price, \$2.00 cloth bound, \$1.50 paper bound.

²*The Shadow of the Arrow.* By Margaret Long. The Caxton Printers, Ltd., Caldwell, Idaho. 1941. 310 pages, many photographs. Price, \$3.50.

³*Sierra Outpost.* By Lila Lofberg and David Malcolmson. Duet, Sloan & Pearce, Inc., New York. 1941. 253 pages. Price, \$2.50.

lizards with milk, so they would eat the ants, tempting coyotes to keep the ground squirrels in check, and encouraging pet skunks to lessen the prolific field mice. Here they learned unforgettable things about wild animals, the friendliness of the wintry forests, the joy of solitude, and the happiness, after solitude, of seeing friends again. Here they established the highest year-round bird-banding station for the U. S. Biological Survey. And here they made their great contribution to the knowledge of the habits and characteristics of the coyote, by observing him closely over a long period of time, and proving him to be rather different from the traditional picture of the coyote as mean and vicious.

At first glance, one feels disappointment that there are no illustrations in the book, except for the one helpful sketch of a rabbit track. A map of the country described would add to the enjoyment of the book (what book about mountains is complete without a map?). But the word pictures are more vivid than photographs and much more satisfactory. We can see those coyotes as clearly as if we, ourselves, knew them.

H. T. P.

CONSERVING WILD LIFE¹⁰ This very readable book explains the problems of conservation simply and well. In the first chapters the author covers the basic facts in this field and shows the close relationship of all conservation problems and their dependence on each other. Soil, water, forests, and wild life must all be taken into consideration together, as to protect and conserve one without the others is fruitless. There is clear discussion of present problems and the efforts made to meet them.

In the remainder of the book, specific problems of certain groups of animals and birds are considered. What the dangers are of too great depletion, what has been done already to protect them, and what must still be done are well explained. Chapters on resident game, migratory birds, fur animals, nongame mammals and birds, rare and vanishing species, and predator relationships make extremely interesting reading for any conservationist, and very enlightening and valuable study for potential conservationists who may have never quite recognized the far-reaching importance of all phases of this field. As Director of the Fish and Wild Life Service, Mr. Gabrielson is well qualified to present it, and also he has access to fine photographs and other illustrations which add greatly to the clarity and value of the book.

H. T. P.

ATTRACTING BIRDS¹¹ Would you like to know the best way to identify and list the birds? Do you need practical information regarding nesting boxes? Are you interested in bird photography? Answers to these and many other questions by authorities such as Roger Peterson may be readily found in the *Audubon Guide*. There is a wealth of suggestions for

¹⁰*Wild Life Conservation*. By Ira N. Gabrielson. Macmillan Company, New York. 1941. 250+xviii pp., 56 illustrations. Price, \$3.50.

¹¹*Audubon Guide to Attracting Birds*. Edited by John H. Baker. Doubleday, Doran and Co., Garden City, N. Y. 1941. xviii+268 pages, illustrated. Price, \$2.50.

the layman within the covers of this book, particularly for the bird student who wishes a general survey of the most important factors involved. The title is rather a misnomer as a good deal of general information is sandwiched in. We find a sketch of the Audubon Society itself, a chapter devoted to conservation, and a statement of the modern attitude toward predators which have their part to play in maintaining the balance of nature. The work concludes with a long list of trees, shrubs, and vines that are attractive to birds, and a short bibliography of useful popular references. The half-dozen or so illustrations of such birds as the red-breasted nuthatch and the yellow warbler are of minor importance, but the line cuts used in connection with the description of bird houses have a practical value. One word of caution should, perhaps, be given. Some of the data concerns primarily the northeastern part of the United States; inclusion of articles from other sections would present a more representative picture of Audubon activities. IVANDER MACIVER.

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LESSONS FROM THE WILD¹² From Oregon to Death Valley, California coast to High Sierra, Ruth and H. D. Wheeler and their two boys "follow the western trail" just as any family might, finding delights at every turn and "learning the lessons from the out-of-doors that will build...for better things in the future."

They have the most fun when they leave the trails and go off on a bird hunt—with cameras, of course. Birds are the author's primary interest, and gaining their confidence is her greatest joy. Her ability is shown by the photographs and by her story of the taming of a cedar waxwing. Among the wild birds observed and photographed are gulls, oyster catchers, turnstones, wild geese, sandpipers, water ouzels, mountain quail, killdeer, sandhill cranes, avocets, ibis, and rosy finches. Animals, too, are seen and enjoyed along the way. Mrs. Wheeler writes with enthusiasm about desert and seashore, but finds the most satisfying adventure in that "area of the high mountains where the dark green sea of forest breaks on the rocky cliffs."

B. S.

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A FIELD GUIDE TO WESTERN BIRDS¹³ Mr. Peterson's successful method of field identification of bird life is due chiefly to his aptitude in using his illustrations in the most efficient manner for each kind of bird and the fact that the observer can assimilate the differences and likenesses of a given group far more clearly and quickly from a page of pictures than from one or more pages of text. The illustrations are mainly half-tones which indicate the light and dark areas of a bird as it is most often seen—at some distance and in poor light. Color plates, six in all, are used when they are a definite aid in determination of species. Included when necessary are suitable line cuts of bills, heads, tails, or bodies to emphasize identifying characters and in many cases the flight pattern is pictured.

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¹²*We Follow the Western Trail.* By Ruth Wheeler. The Macmillan Company, New York. 1941. xiv+160 pages, photographs. Price, \$2.00.

¹³*A Field Guide to Western Birds.* By Roger Tory Peterson. Houghton Mifflin Co., Boston. 1941. xviii+240 pages. Many illustrations. Price, \$2.75.

There is a marked improvement in the printing of color plates and half-tones over the eastern edition (*A Field Guide to the Birds*). Because of the compact size and improved approach to field identification methods, wherein each species is adequately pictured, *A Field Guide to Western Birds* is heartily recommended to the student of birds, particularly the beginner. The region encompassed by the book is roughly the United States west of the Great Plains.

RICHARD G. JOHNSON.

ALL KEYED UP¹⁴ The "revised edition" of Prof. Jaeger's work on the wild flowers of our Californian deserts is not so much a revision as it is a second printing in which a few corrections have been made and to which a key has been added. There was scarcely need of revision—the work was excellent as far as it went; but, as I pointed out in my review of the work a year ago (*Sierra Club Bulletin*, 26:1, 153), there was a real need for a key or a synoptical outline by which the names of over 750 kinds of plants might be more easily traced.

The key has been prepared by Ruth Cooper, botanist at the Riverside Junior College, and it seems to be adequately constructed so that anyone can use it even without a knowledge of technical botany. My only criticism is that it doesn't go far enough in several of the genera represented by fifteen or more species. Distinctions between species in such groups are necessarily critical and it is true that it may not be possible to construct a simple non-technical key to such a series of plants. But even if they had to be more complex, special outlines should be included for the determination of such groups as the buckwheats (30 kinds even without the varieties of *Eriogonum fasciculatum* which seem to have been omitted), the locoweeds (23 kinds), the various giliae (23 kinds), the phacelias (21 kinds), and the desert forget-me-nots (20 kinds). Only students with a really critical background can readily distinguish the species of these groups as they are presented; the non-botanical person will find them a source of real confusion, if not discouragement. Prof. Jaeger saw fit to include in his book all the desert species in these groups, and rightly so; but there must be a complete key to them if they are to be properly enjoyed and appreciated. JOHN THOMAS HOWELL.

ABOUT CONIFERS¹⁵ Here is a pocket-size, nontechnical manual—ideal for field trips —for those interested in distinguishing the conifers, giving the inexperienced observer valuable hints on the most important tree characters. Instead of the usual technical keys, Nathan A. Bowers, the author, presents a unique Needle Key which is a good starting place for identification. It is followed by an Elevation Key and a Geographical Key. When these are used together they give the locality and range of any of the fifty-six cone-

¹⁴*Desert Wild Flowers*. By Edmund C. Jaeger. Revised Edition, with Key by Ruth Cooper. Stanford University Press. 1940. xxx+322 pages; numerous illustrations. Price, \$3.50.

¹⁵*Cone-bearing Trees of the Pacific Coast*. By Nathan A. Bowers. McGraw-Hill Book Company, Inc., New York. 1942. 167 pages, illustrations. Price, \$2.50.

bearing trees of the Pacific Coast. The body of the book consists of a detailed description and illustration of each of the varieties, to be used as final checking in identification.

MAXINE CHENOWETH

WOODS AND WOOD¹⁸ The word "woodcraft" has two interpretations. It is a skill of forest living, or a skill in constructing articles of various woods and wood products. Bernard Mason discusses both, in chapters dealing with outdoor comfort and safety, and in other chapters, which deal with barkcraft, woodcraft knickknacks, Indian accoutrements and decorations, rawhide and buckskin making, and even tincan craft. *Woodcraft* certainly contains a great deal of information clearly presented; however, it would have been far better to have made it two books. One who wants outdoor comfort with a light pack or canoe load is not concerned about making a rustic electric lamp or fashioning articles that are usually found in a weekend cabin or summer home. Since books of this type have their maximum value only when employed in the regions where the natural conditions described in the text prevail, Easterners will find it far more useful than those of the mountainous west.

RICHARD G. JOHNSON.

SOME GREAT MOUNTAINS¹⁹ The author does not claim that the mountains chosen for the ten chapters of his book are the ten greatest mountains in the world. To do so would at once provoke rival claims and endless discussion. All that he asks is that each mountain chosen shall be great, and for his purpose he starts right out with Snowden and Ben Nevis, for, "being where they are and what they are to us in Britain, we know their claim to greatness." This leaves us without an argument and we are free to choose for our own purposes our own particular pets, whether they be mantled with perpetual snow or crowned with blueberry bushes. So we shall say no more about including two mountains from the British Isles and one from the continents of America and proceed to enjoy the rather unusual fare that is set before us. The book is a rambling affair, comprising in part the author's own experiences, in part the adventures of others. The chapter on Mont Blanc is an example of the former, although here, as elsewhere the author's identity is naively veiled. One may easily peer behind the veil, however, merely by turning to page 148 of the *Alpine Journal*, Vol. 32, September, 1918. German climbers are given a generous amount of space in this small British volume—they are the protagonists in four of the chapters: the Matterhorn, Ushba, Kangchenjunga, and Nanga Parbat. The Everest chapter goes over the well-known ground leading to the question, Can it be climbed? Mount Cook and Mount Logan provide geographical diversity. One hopes that the author will discover in *The Handbook of American Mountaineering*, if not in the Oxford Dictionary, the distinction between a *snow-cave* and an *igloo*.

FRANCIS P. FARQUHAR

¹⁸*Woodcraft*. By Bernard S. Mason. A. S. Barnes & Co. 1939. New York. Many illustrations by Frederic H. Kock. 580 pages. Price, \$2.75.

¹⁹*Ten Great Mountains*. By R. L. G. Irving. E. P. Dutton & Co., Inc., New York; J. M. Dent & Sons, Limited, London. 1940. xii+213 pages, illustrations. Price, \$3.75.

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